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The Journal of Pediatrics

VOL. I JULY, 1932 No. 1

Original Communications

THE AMERICAN ACADEMY OF PEDIATRICS, WHY AND WHAT FOR*

JOHN LOVETT MORSE, M.D.
BOSTON, MASS.

IT IS common knowledge that the attitude of the American public toward the child and his welfare has changed materially since the World War. It has become "child-minded" or, perhaps better, "child-welfare-minded." This change has been due to many causes. It is not necessary to enumerate them. They are familiar to all of you. The public now demands that active measures be taken for the preservation, protection and guidance of children. The public not only demands that such measures be taken, but it will see to it that they are taken. The question is, Who is to undertake, guide, and carry out these measures? In the past they have been undertaken and carried out largely by laymen without adequate medical advice. They will be in the future, unless the pediatrists bestir themselves and take a more active part. It is no wonder that laymen went ahead alone when the pediatrists showed no interest in their work or even opposed it. They had to, even though they realized their need of professional assistance. I believe that in spite of the rebuffs which they have received in the past and the assurance and independence which they have developed, they will welcome the aid and leadership of pediatrists in their undertakings. This is our opportunity and our duty. That it is appreciated, at any rate by the executive board of the Academy, is shown by their vote, Feb. 21, 1931, that it is "The policy of the Academy to create reciprocal and friendly relations with all professional and lay organizations that are interested in the health and protection of children." We should take part in all the great movements which are going on. We should help to direct them, not sit by and find fault because we are not consulted.

*Presidential Address before the American Academy of Pediatrics, New Orleans, May 14, 1932.

It is not only our privilege and duty to take part in these new movements, but it is necessary for our own preservation to do so. If we do not, the public authorities will take them over. This country is rapidly tending toward "state medicine." The federal, state and municipal authorities are continually taking over more and more of the functions of the family physician. Many important questions, such as quarantine, sanitation, and control of water supplies, must necessarily be handled by the public health authorities. They alone have the requisite power. The tendency is for them to increase the scope of their work and to include in it such matters as child welfare and general immunization. Far be it from me to decide how far they should go or where they should stop. They will continue to go on, taking over one thing after another, and rightly so, unless the pediatrists and physicians themselves do the work which must be done. My impression is that the health authorities would be glad to have the physicians do this work, if they would. In the past, however, physicians have been unwilling to cooperate or have actively opposed every advance, and the health authorities have been compelled to go on alone. Unless the physicians do take part in this work and help to lead it, they will soon have no work to do. They will, moreover, have only themselves to blame. It is one of the functions of this Academy to see that physicians take an interest in the child welfare movement and that they take their proper place in it.

As I have already stated the executive board of the Academy voted that it is "The policy of the Academy to create reciprocal and friendly relations with all professional and lay organizations that are interested in the health and protection of children." In order to aid in carrying out this policy we have a committee on relation to philanthropic agencies, welfare workers, etc., a committee on school health and school health education, and a committee on mental hygiene. It would seem as if these were enough. Committees are of no use, however, unless they do something. The important thing is how active they are and what they accomplish. However active they may be, they cannot accomplish much unless they have the enthusiastic cooperation of the state committees and of the individual members of the Academy. It would aid them in their work if we had more associate fellows, and if some of these associate fellows were made members of these committees. If they are to be successful these committees must get the point of view of the laymen, the educators and the public health officials, and be able also to show these groups the point of view of the pediatrist. Most differences can be smoothed away when people understand each other and appreciate what the other is trying to accomplish. Each one has something of value to offer to the other; each one has something to learn from the other. Mutual understanding is necessary. Unreasonable opposition and recrimination will accomplish nothing.

We have had the White House Conference on Child Health and Protection. This conference did a tremendous amount of work, accumulated an immense amount of data and pointed out clearly the roads along which further advances are to be made. Their follow-up committees are endeavoring to make progress in these directions. Many of our members were active, some were leaders, in the deliberations of the conference. Ought we not to be as much or more interested in carrying out the work of the follow-up committees as we were in planning out the work? Ought we not to assist in or take over much of this work? If we are not competent to do it, who is? If we do not, it will be to our everlasting shame. We have a committee on Relations to the White House Conference. It cannot do much alone. It must have the assistance of the regional and state committees and of the members as individuals. Fortunately our president-elect is the man best fitted to bring about the proper liaison between the follow-up committees of the White House Conference and this Academy, and to see that the Academy does its share of the work. Let us hope that he will be successful in stimulating the interest of the Academy in this endeavor, and that he will not meet lack of interest, inertia, or even open opposition from our members.

In Article III of the Constitution of this Academy on the "Objects and Powers of the Academy" it is stated that the Academy shall endeavor "to establish and maintain the highest possible standards for pediatric education in medical schools and hospitals" and "pediatric practice." The Academy, at its meeting at Atlantic City in 1931, approved the recommendations of the Subcommittee on Medical Education of the White House Conference. We have three committees to aid in carrying out these recommendations—on medical education, hospitals and dispensaries, and nursing education in pediatrics. The first of these committees, at least, is very active. We shall hear their report later. I do not know what it will be, but am sure that it will be constructive.

As for myself, I am not especially worried about the teaching of pediatrics in our medical schools. It is, of course, feeble enough in some of them. It is a relatively simple matter, however, to jack up the medical schools and bring them up to standard, as pressure can be brought to bear. The only real danger that I see is that in some of our "Class A" schools, in which many or most of the instructors have had no experience in practice, the students may be taught too much laboratory and too little bedside pediatrics. Another fault which I notice is the failure to lay sufficient emphasis on the human side of pediatrics, as Brennemann has pointed out. Can we not impress on the teachers in our schools, the staffs of the hospitals, the nurses, and the students the fact that their patients are not simply cases and subjects for study, but somebody's children, as dear to their parents as their own children are to them now or will be when they have them?

Nor am I worried about higher degrees, or whether specialists in pediatries are licensed or certified. What troubles me is the lack of knowledge of and of interest in children among the physicians now in practice. Time will, of course, remedy this. The young men, however, think that many of us live a long while! These older men must be reached, interested and taught. We must not wait for the younger generations to take their places. I shall not attempt to advise our committee as to how this shall be done. I would suggest, however, short courses for graduates and extension courses. More frequent meetings of local, county, and state societies in which pediatric questions are discussed would also help. Finally, I am assured that our children's hospitals and medical schools are not doing their duty in helping the physicians in the localities in which they are situated to become acquainted with the progress which is being made in pediatries. They should consider it as much their duty to improve the standards of pediatric practice in their communities as to teach students.

The members of this Academy, representing, as they do, the best in pediatries in North America, should set the standards for practice throughout the country and in their own communities. It is their duty to raise these standards. They must be leaders, not followers. They must teach by the good example which they set. To accomplish this they must be sane and conservative. They cannot afford to be led astray by fads or become overenthusiastic over new methods of diagnosis or treatment until the verity of the claims made for them is proved. Unfortunately some of our own members are, or have been, the leaders of many of these fads and most enthusiastic over new and untried methods. They are among the worst offenders. We must operate on the cataracts in our own eyes before we attempt to remove foreign bodies from the eyes of others. What can we do to curb our own members and the profession at large? We might refer the matter to our committee on clinical investigation and scientific research. Perhaps a new committee on nostrums, nonsense and nuisances might be better. Incidentally, I would not mind being chairman of such a committee. We must also be careful that in our wide-eyed innocence we are not seduced or led from the narrow path of rectitude by the wiles and blandishments of the commercially minded manufacturers of cure-alls and the proprietors of various and sundry foods. I fear that in the past a few of us have strayed a little from the path of virtue. This will not do. Like Caesar's wife, we must be above suspicion.

Among the objects of the Academy, as stated in the constitution, are "to establish and maintain the highest possible standards for pediatric research" and "to encourage contributions to * * * scientific literature pertaining to pediatries." These are most admirable objects. They should constantly be kept in mind by those of our members who are

teachers in medical schools. They seem to be the special functions of the committee on clinical investigation and scientific research. I must confess, however, that it is very hard for me to see just how this committee is to carry out these functions. Let us hope that it can see further and more clearly than I can. I would suggest, however, that it endeavor at all times to have a comprehensive view of the broad field of research and from time to time suggest lines along which research is most needed and most likely to be fertile. It is a pity, for example, that the initiative for research as to the normal needs of vitamin A should have been taken by a manufacturer of foods.

Fertility reminds me of Zinsser's observation that "many a man and woman is patiently sitting on a lifeless idea like a hen on a boiled egg." It seems as though our committee might do something to discourage the useless and unproductive "research" which is going on in our medical schools and hospitals. Young men and women, entirely unsuited for research, are urged to undertake "arbeits" when they ought to be learning how to keep children well, how to find out what is the matter with them when they are sick and what to do about it, and, finally, how to practice medicine. Some men have the "scientific mind" and are natural investigators. They cannot be kept away from investigation any more than a duck from water. They should be encouraged in every way. Puddles, ponds, and lakes should be provided for them according to their size and ability. Chickens and young turkeys do not like the water and are not intended to go in the water. Water is bad for them. They should, therefore, be kept on dry land and not be forced into it.

The executive board, at its meeting on Nov. 28, 1931, voted that one of the duties of the state committees was "To interest themselves in all problems pertaining to pediatricians, and especially to cooperate with all agencies concerned with child welfare and child health in their respective states." This duty, it seems to me, is a very real one. The state committees are better acquainted with the local conditions in their own states than any national body can possibly be. They know personally, or can get to know, the health officials of the state and the lay men and women interested in child welfare undertakings in their state. They know the practicing physicians in the state and their attitude toward such movements. They are, therefore, in a position to influence all of these factions. No one else can do it so well. I heartily concur with one of the recommendations of Dr. Stuart to the Massachusetts State Committee, which is as follows: "That the committee attempt to cooperate actively with the state department of health, as well as with other organizations similarly minded, in efforts to improve the child health service available throughout the state, in making it available in those communities where there is no adequate service at present,

in passing upon the medical desirability of plans prepared by these organizations, and in seeking the cooperation of practicing physicians in plans that are acceptable."

The individual members of the Academy, especially those who live in the smaller cities or in towns, are in an even better position than the state committees to aid and lead in carrying out the various projects for child welfare in their own communities. The success of the Academy in its campaign for the improvement of the health of the children of the country depends in the last analysis largely on the energy and initiative of its individual members. I thoroughly appreciate the opposition which many of you will encounter. Sad to say the most vigorous opposition is likely to come from other physicians in your community, the attitude of a considerable proportion of the medical profession toward the question of child welfare being either that of the ostrich or of the dog in the manger. You will be accused of attempting to feather your own nest and of taking an unfair advantage of your fellow practitioners. The attempt may be made to ostracize you or you may be haled before your county society for unethical conduct. Nevertheless, keep on. Try to comfort yourself with the old "bromides" that "virtue is its own reward," "the wicked" eventually "cease from troubling" and that "right is right—to falter would be sin."

The objects of the American Academy of Pediatrics, as I see them, are primarily altruistic. They are in brief: to improve the health and welfare of our children, to raise the standards of pediatric education and practice, and to encourage research in pediatrics. "None of which objects are for pecuniary benefit." Nevertheless, some of our members and many of those who are considering applying for membership ask, "What shall *I* get out of it?" The answer to this question is, "As much as *you* put into it."

Looking at the question entirely from a selfish point of view, every member, as well as every pediatrist even if he is not a member, will profit financially from an increasing interest of the public in child health and welfare, if the public is taught to appreciate properly the part which pediatrists should take in improving conditions. Every well-trained and qualified pediatrist will get a larger proportion of the practice among children than his poorly trained and poorly qualified competitors, when the laity learns that simply calling himself a pediatrist does not make a physician one. They will learn that in order to be a pediatrist a physician must have special training. They will learn that only thoroughly trained and competent men can become members of this Academy. No real pediatrist can then afford, therefore, not to be a member. Unless he is, he will be outside the pale.

No pediatrist, however well trained and well informed, can fail to be benefited by the advances in pediatric knowledge and practice ad-

vocated by this body. He will be aided more, if he has a part in making or furthering these advances.

This is only the second meeting of the Academy. The organization was hardly completed at the first meeting last year. Few but the founders understood until that meeting what it was all about. Unfortunately some apparently do not now. The first meeting was necessarily devoted entirely to organization. At this meeting there are in addition to the business session round-table discussions of the most live topics in present-day pediatrics, and addresses by men of national reputation in their respective fields. It is difficult to see how those of our members who attend these exercises can fail to "get something out of them." It is reasonable to believe, moreover, that each annual meeting will be better than the last and that there will be more and more to be learned at them.

Even now the Academy has only partially begun to function. The various committees are just beginning to take up their work. The first number of the new JOURNAL OF PEDIATRICS, the organ of the Academy, will not be published until July. The members of the Academy should certainly get something out of that besides being able to keep in touch with all that is being done in and by the Academy. The Regional Committees have not yet undertaken what seems to me to be one of their most important duties, namely, the holding of clinical meetings of several days' duration once or twice a year in the large medical centers. I trust that they will soon begin. Such meetings will not only provide an opportunity for our members to know and appreciate each other but should also be of the greatest educational value. I cannot see how any one can fail to get a great deal out of such meetings.

I hope that I have shown that every pediatrist, who is worthy of the name, can get something out of the American Academy of Pediatrics. I trust that I have also shown that he cannot get on without it. I shall have failed, however, if I have not convinced him that what he gets from the Academy is purely incidental and entirely subordinate to the primary and altruistic objects of its work. In closing I offer as a suggestion that the American Academy of Pediatrics adopt as its motto that of one of the medical fraternities, of which I have the honor to be a member, which is—*Non solis nobis*—not for ourselves alone.

319 LONGWOOD AVENUE.

POSTANGINAL SEPSIS*

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THE subject of postanginal sepsis, also called postanginal pyemia, or septicopyemia after angina, and a variety of other designations applied to the same condition, has received considerable attention mostly in the otolaryngologic literature. Occasionally I have encountered septic conditions which have suggested a septicopyemic state, following tonsillar and pharyngeal infection, in infants and young children. In order to satisfy my interest and curiosity, I have instituted a personal inquiry among pediatric colleagues, who have had a large experience in the treatment of septic sore throats as well as scarlet fever, and I have also made a survey of the literature in order to determine the frequency with which these cases of postanginal sepsis occurs among infants and children, and also the course, nature, and treatment of this complication.

So far as can be ascertained, the first recognized case of postanginal sepsis was described by J. W. Long[1] in 1912. This patient suffered from a tonsillitis; on the fourth day of the illness chills and irregular temperature developed. Several days later it was found that the patient was blind in the left eye due to hemorrhage in the vitreous humor. Long explained the eye symptoms by the presence of thrombi in the cavernous sinus which apparently had extended from the internal jugular vein through the inferior petrosal sinus.

The internal jugular vein was dissected out. It was distended, and indurated and its numerous branches were similarly involved. The vein was ligated and its larger tributaries such as the facial and thyroid veins were also isolated and ligated. The excised veins showed numerous thrombi containing pus and streptococci. The patient recovered after a protracted convalescence.

Charles Goodman,[2] in 1917, reported a similar case in a woman aged thirty-five years. H. P. Mosher[3] in 1919 wrote about a young man, twenty-six years of age, who developed a postanginal sepsis with thrombosis of the internal jugular vein.

Mark Reuben[4] in a recent paper on this subject referred to some earlier cases of postpharyngeal sepsis going as far back as Hippocrates and Galen. As a matter of fact, however, this form of sepsis with thrombophlebitis of the internal jugular vein has only recently received careful study.

*Submitted for publication, June 4, 1932.

There is no noteworthy mention of postanginal sepsis in the German literature until 1921. At the First International Congress at Copenhagen, in 1928, pharyngeal sepsis was an important theme. This subject has received continued attention within recent years and series of case reports have been contributed from many sources.

In 1924 Fränkel[5] showed that in the majority of cases of postanginal pyemia there is a thrombophlebitis in the small veins of the tonsils as well as in the facial vein extending into and involving the jugular.

The subject has been further studied by Uffenorde,[8] Zange,[16] Claus,[10] Martens,[17] Waldapfel,[9] Kissling,[14] Joel,[18] and Burchardt,[19] Reye,[20] Lewin,[21] Rössle,[22] Wessely,[23] Melchior,[24] Keppler,[25] Riecke,[26] Artusi,[15] Lenhartz,[11] Sternheimer,[12] and C. Hirsch.[27] Extensive reviews have recently been contributed by E. Petzal[6] and O. Voss.[7]

ANATOMY

In a review of this nature it seems undesirable to enter into a detailed discussion of the anatomical structures of the pharynx, though it must be mentioned that there are two important regions which may serve as the atria of infection. The retropharyngeal space lies anterior to the vertebral column and extends upward to the base of the skull and downward toward the posterior mediastinum. It lies between the pharynx in front and the vertebral column behind. It is enclosed anteriorly and posteriorly by two layers of fascia. It invests the superior constrictor of the pharynx and is continued forward on the buccinator muscle. Laterally it blends with the sheaths of the great vessels.

The parapharyngeal space is the connective tissue space which is separated medially from the tonsil by the constrictor muscles of the pharynx and the parapharyngeal fascia. The lateral boundary is formed by the internal pterygoid muscle, the ascending ramus of the lower jaw, and the capsule of the parotid. The space extends upward to the base of the skull and downward along the esophagus and larynx into the posterior mediastinum. It is filled with connective tissue and fat, as well as important vessels and nerves. Here are found the carotid, the internal jugular, the ninth to twelfth cranial nerves, and the sympathetic nerves. There is also a rich network of veins, and numerous lymphatic glands.

An opening in the parotid fascia communicates this space with the parotid gland. Through an opening at the styloid process infection may spread from the pharyngeal space into the parotid gland, and from here infection may spread to the bony and cartilaginous ear which are situated above.

PATHOGENESIS AND PATHOLOGY

Fränkel first pointed out that the nature of postanginal sepsis was determined by the occurrence of a thrombophlebitis of the tonsillar veins. These thrombi extend progressively until a jugular thrombophlebitis is produced. Subsequent metastatic infections may occur in various parts of the body because it is thought that small thrombi become free and periodically enter the circulation, causing such symptoms as chills and fever. These small thrombi may produce infarcts in the lungs with associated pleurisy and empyema, or they may pass into the general circulation involving joints, muscles, kidneys, spleen and liver.

Intracranial complications may occur. Small thrombi may pass from the retrotonsillar veins through the pterygoid plexus into the cavernous sinus. Or the thrombi may originate in the internal jugular vein and be transmitted to the sigmoid and transverse sinuses ending in purulent meningitis.

Uffenorde[8] who has written extensively on this subject is not in full agreement with Fränkel's *hematogenous* theory as to the spread of infection. He differs from Fränkel by believing that lymphangitis and lymphadenitis are the primary processes, and the injection extends secondarily to the veins causing a peri- and endophlebitis with associated thrombosis.

Waldapfel supports Uffenorde's view and shows that the invasion into the jugular vein as a result of lymphatic abscesses may occur not only in one but in numerous places along the course of the vein. Claus[10] on the basis of histologic investigation, thinks that the majority of cases of postanginal sepsis originate in abscesses which are found in the proximity of the tonsil, and that these pus collections spread deeper into the loose connective tissue of the pharynx and attach themselves to the walls of the veins, large and small, producing purulent peri- and endophlebitis.

Thus we have three views for the route of infection, the hematogenous, the lymphatic, or by continuity through the tissue spaces. In whatever way the infection occurs, the end-result is the same. Thrombophlebitis and pyemia constitute the clinical aspect of the disease.

ETIOLOGY

Postanginal sepsis is not due to a particular organism. None of the bacteria which have been recovered from the septic processes have given rise to a characteristic clinical course. All seem to act about the same. Lenhartz[11] described one case of staphylococcic sepsis and Schottmüller described several cases where staphylococci were found. It has been maintained that this group of organisms was especially likely to produce phlebitis and thrombophlebitis. Hemolytic streptococci

and streptococcus viridans have been demonstrated in the pus and blood of some of these patients. The organisms are more readily recovered when a phlebitis or thrombophlebitis is present. It has been difficult to obtain positive cultures from the lymph nodes. Claus recommended that the blood be obtained from that point in the blood stream where the septic focus communicated with the general circulation. He thought that this method gave positive results, whereas blood withdrawn from remote vessels usually proved negative for organisms. The anaerobic organisms seem to be most frequently found in postanginal pyemia, and seem to produce thrombophlebitis. Thus the Streptococcus putrificus (Schottmüller), an anaerobe was found frequently. Consequently, the anaerobes, according to the observation of numerous authors may be said to preponderate as the exciting organism in postanginal sepsis. The aerobic infection is not considered to be as malignant, and indeed, most cases of postanginal sepsis that recovered have been thought to be due to the aerobic type of infection.

The disease usually follows a tonsillar infection, or sepsis may be preceded by a pharyngeal phlegmon, an intratonsillar abscess. There are a few cases in which the sepsis occurred during a scarlet fever attack, or after a tonsillectomy in which severe infections followed. As a rule the focus from which sepsis develops is the retrotonsillar phlegmon. Whether a bacteremia or pyemia develops depends upon various factors difficult to determine. We speak of the immunity of the patient, the kind of organism which is found in the focus of infection, as well as its virulence. Whether there are other factors to be considered it is impossible to state. It is known, however, that when phlebitis or thrombophlebitis, occurs a threatening situation will ensue.

An idea of the relative incidence of the disease, as well as the age of occurrence may be illustrated by Uffenorde's analysis of 137 cases of postanginal sepsis. There were 87 males and 50 females. Three were under ten years of age, the youngest patient being five years old. While the low incidence reported in children of various ages must be accepted as correct in our present knowledge of the disease, nevertheless, more careful attention to clinical manifestations and more detailed autopsy records may show that our present estimate of the frequency of occurrence in young life has been underestimated.

CLINICAL COURSE

It has already been stated that the majority of cases hitherto reported, occur in young healthy individuals. The greatest incidence is between twenty and thirty years. Localization on the left side seems to be more frequent than on the right. The pyemia may develop very shortly after the primary focal infection or the symptoms of sepsis may

be deferred as long as four weeks after the primary disease, though an analysis of all the cases shows that the average length of time which elapses is ten to fourteen days after the original infection. This constitutes a latent period, during which the patient seems comparatively well. Waldapfel goes so far as to say that every angina in which the fever has not subsided in three days may be complicated by postanginal sepsis. If septic infection occurs after tonsillitis or pharyngeal phlegmon, one observes early painful swelling of the cervical gland on the affected side, located usually at the angle of the jaw.

The occurrence of chills is of great importance, especially if they are observed after the angina has subsided. (Sternheimer.[12]) The occurrence of a chill indicates that organisms are gaining access to the circulation and that the inflammatory process is no longer localized or walled off. Remittent fever may be associated with chills. In the severest forms of the disease a continuous high fever may be present without chills, extensive metastasis may occur and death results after a short period. The patients present the general symptoms usual to a septic infection, such as pallor, subicteric hue, dry tongue, rapid pulse and rapid respiration, malaise, prostration and somnolence.

One would think that postanginal sepsis should occur in severe cases of scarlet fever. As has been suggested by Claus, the development of thrombi is proportional to the severity of the infection. In the most virulent infections, thrombi do not occur. It must be considered in a sense at least that the formation of a thrombus is a defensive mechanism calculated to protect the individual against overwhelming blood-stream invasion. In the most severe types of sepsis, the bacteria may gain access to the blood stream in massive numbers, without producing phlebitis or thrombi. For this reason Friedemann and Elkeles[13] find an explanation why thrombophlebitis does not occur in cases of foudroyant scarlet fever sepsis.

In some cases thrombi have been identified in the tonsillar vein, though in other instances only inflammatory changes in the walls of the vein have been found. Nevertheless, in either case they found that ligature of the jugular vein gave favorable results. These same authors also observed that during the second or late period of scarlet fever recurrent streptococcus infection with severe septic or pyemic manifestations led as a rule to a fatal termination.

COMPLICATIONS

The most serious and most frequent complication is the formation of metastatic foci in the lungs. (Kissling.[14]) Periarticular abscesses or septic arthritis are not infrequent. Abscesses in muscles and liver, suppurative kidney processes, and cavernous sinus infection, with the production of ocular symptoms, and purulent meningitis have been observed.

Paralysis of the hypoglossal nerve and the recurrent laryngeal nerve may result from abscess formation in the parapharyngeal space.

A few case reports of children suffering from postanginal sepsis will illustrate the clinical manifestations.

CASE 1.—K. J., female eight years old (reported by O. Voss[7]). Fourteen days before admission the child developed scarlet fever and was given convalescent serum. The temperature fell and the rash disappeared. Eight days later the child developed fever with tonsillitis and bilateral lymphadenitis. The attending pediatrician suspected peritonsillar abscess. The child complained of difficulty in swallowing. On the left side of the neck cervical glands could be palpated which were hard, painful to pressure and not fluctuating. The temperature was elevated, though there were no chills. A deep thrombophlebitis was suspected, an incision was made, some swollen lymphatic glands enveloped the sheath of the blood vessels. The jugular vein in its upper portion was thrombosed and cord-like. It was ligated and excised. Some thin pus exuded from an area posterior to the jugular, but upon further blunt dissection it was found that a large abscess was located between the carotid and the vertebral column. The left tonsil was subsequently removed and the child recovered.

CASE 2.—(Reported by Reye.[20]) Female, aged eighteen, developed an acute case of tonsillitis, with fever. In a very short time the cervical lymph nodes on the left side became intensely swollen and painful. She developed recurring chills, the fever was irregular, multiple abscesses occurred, which were localized in the supraclavicular space, the upper arm and in the articulations of the foot. These were incised. The patient died after a severe illness. The autopsy showed well-marked thrombophlebitis of the left internal jugular vein with metastatic abscesses of the lungs and muscles.

CASE 3.—(Reported by Carlo Artusi.[15]) Maria R., three and one-fourth years old. It is to be noted that the illness in this child began with a tonsillar infection. The crypts of the tonsils contained large numbers of organisms and small abscesses occurred in the right tonsil. On admission to the hospital the patient showed all the symptoms of a generalized infection with *metastases*. Examination showed multiple abscesses, uveitis, keratomalacia, cardiac involvement, meningitis, and chronic otitis media. The child died on the fifth day after admission.

The autopsy showed a thrombophlebitis of the jugular vein and of the left transverse sinus. There were multiple ulcers on the tongue, ulcerative endocarditis, and a seropurulent pleurisy, and a confluent pneumonia. There were also necrotic areas in the kidney. While it was not possible to determine whether the jugular thrombosis had originated from the middle ear or the pharynx, nevertheless, the otitis was chronic in character and the severe infection and thrombophlebitis followed shortly after the acute sore throat.[7]

CASE 4.—(Reported by O. Voss.) A girl seven years old, had a severe sore throat, fourteen days previously with high fever. Five days before, she developed swollen, painful lymph nodes on the left side of neck. High temperature was present, but no chills. Both tonsils were red and swollen, though the one on the left side was more involved. Temperature 102°, pulse 130. The temperature continued as well as such general symptoms as prostration and anorexia. A vertical incision was made over the swelling at the left side of the neck, and a large mass was found which covered the sheath of the vessels, the walls of which were enormously indurated. The jugular vein was ligated. Continuing the dissection a large abscess containing three or four tablespoonfuls of pus was located behind the great vessels, and

the abscess cavity was found to extend to the spinal column. At the same time the left tonsil was removed and two days later the right tonsil was enucleated because of the continued rise in temperature. The patient eventually recovered.

PROGNOSIS

The prognosis in postanginal sepsis is grave. Uffenorde collected 137 cases and only 40 recovered. These were cured by operation. In 17 cases reported by Reye, 12 died. Waldapfel lost 25 cases out of 43 who came under his care. Of these 25 fatal cases 17 were operated upon and 8 were not. Claus reports 14 deaths in 28 cases.

In general it may be said, the earlier the purulent focus is detected and the contents evacuated, the more favorable the prognosis. Prompt surgical procedure, whether it be evacuating an abscess or ligating the jugular vein will diminish the hazard of the disease and lower the mortality.

TREATMENT

The treatment is for the most part surgical. If the septic focus can be located it should be drained. Unfortunately the area of infection usually lies deeply imbedded and is difficult of access. In some instances abscesses in or about the tonsils may be incised. The tonsillar veins are sometimes filled with infected thrombi and Zange advises that all of these small veins be ligated.

The parapharyngeal space may be the site of infection and drainage of this small area may cause the greatest difficulty and requires unusual technical skill. Where symptoms of general sepsis are present as evidenced by chill and irregular fever, the jugular vein on the affected side should be ligated as early as possible, in order to prevent the formation of metastatic foci through the various tissues and organs of the body. All writers on the subject agree that early ligation of the jugular vein is the only logical treatment when the diagnosis of septic thrombophlebitis has been established.

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THE CARE OF PREMATURE INFANTS*

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DETROIT

THE care of immature infants has always been difficult and rather costly because of the length of time necessary to bring them to the point where they could be treated as normal, healthy babies. At the Children's Hospital of Michigan we have passed through several phases during which different methods were used, and it is our purpose in this paper to describe the experiences of the past two years.

In reading the literature one is struck by the variations in opinion as to the most suitable methods of care necessary to achieve the best results with premature or immature infants. It would seem that what is satisfactory in one place is quite unsuitable in another. Many factors must be taken into consideration, such as the type of hospital, the social status of the parents, the facilities for following the patients after they leave the hospital, and the climate. In this hospital, for instance, we have to face several difficulties over which we have no control and which all tend to make our results unsatisfactory and discouraging even at the best. The first of these is the fact that the infants are delivered at home or in other institutions and reach our incubators only after a considerable length of time, ranging from a few hours to several weeks. As a result our mortality will always be high because about 35 per cent of the infants admitted die within the first forty-eight hours after they reach the hospital. Hess and Chamberlain[1] in their analysis of 266 cases from the Sarah Morris Premature Station emphasized the high mortality in the group of patients born at home, particularly within the first forty-eight hours after admission. The second unfavorable factor is that many of the homes are grossly overcrowded and lacking in all the facilities necessary to raise even vigorous children, so that when the infants are returned to their parents their life is threatened by infection, lack of air and sunshine, as well as by ignorance of proper care. Lastly, we are situated in a climate where rapid fluctuations of temperature and humidity are of frequent occurrence, both of which add greatly to the incidence of respiratory infections.

Since 1926 there has been a special premature cubicle in use and all infants weighing less than 2500 gm. are sent there directly from the

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admitting department if they are believed free from infections. This room has ample light from large windows at all times of the day, and the windows are also arranged so that when desired the air can be heated before it enters. A direct steam line insures an adequate amount of heat, free from fluctuation, whenever it is needed, thus making possible an unvarying temperature of about 80° F. During the fall, winter, and spring months a humidifier is kept in almost constant operation (Fig. 1).

The individual incubators have been designed for simplicity, ease of operation and safety. Each incubator consists of a regulation size

Fig. 1.

infant cot, with an accessory framework made of small sized piping fitted on the top, the whole structure being covered by blankets and sheets pinned in such a way as to leave an opening on the top directly over the baby's head. Heat is supplied by two carbon filament electric bulbs so that it is a very simple procedure to vary their size or turn them off to obtain any needed temperature. The baby's eyes are protected from the lights by a curtain which is dropped from the top of the framework to the baby's neck. The advantages of such an incubator are: (1) mechanical simplicity, which gives almost foolproof operation; (2) the infant's head is protected from any drafts which may arise in the room; (3) the baby may be fed and cared for without

the dangers incidental to removing it from the heated tent. Baths of warm oil are given daily while soap and water baths are administered only once a week.

As has been stated above, we try to keep the temperature of the premature room as close as possible to 80°. This can be done very readily in the cooler months, but in the very hot months of summer it frequently rises above this point as there is no method of cooling the air. The temperature of the individual incubators is kept at a point sufficient to prevent loss of body heat so that the baby's temperature is kept between 98.5° and 100°. Newly born infants of very small weight will frequently require an incubator temperature of over 100°, but this can be gradually lowered until at the end of three to four weeks 80° to 85° is sufficient.

During the summer months in the Detroit area, at which time the average mean temperatures were somewhat comparable to the average temperature of the premature room, official figures obtained from the weather bureau (1930) showed that in June, July and August the relative humidity varied from 42 to 68 per cent with mean temperature ranges from 79.6° to 65°. In the summer of 1929 the relative humidity averaged a trifle more with somewhat lower temperature levels. Hence in our attempt to keep the relative humidity close to 60 per cent we have been keeping near the level it naturally assumes during the time of year in which we find the least amount of respiratory infection and when the average child's health is at its best. With a temperature of 80° and a relative humidity of 55 to 60 per cent, the atmosphere is found to be very comfortable by the nurses and others going into the premature room. At this point, too, loss of body heat is reduced to a minimum when slight fluctuations occur in the room temperature.

The question of temperature and humidity has received consideration from numbers of workers but exact information as to the ideal levels (particularly humidity) is surprisingly scarce. La Fetra[2] stated that his results were much improved at Bellevue Hospital by raising the humidity and lowering the temperature but gave no definite figures on humidity. Sinclair[3] advocated a basket temperature of from 80° to 90° with a relative humidity of 60 to 70 per cent. Talbot advocated a temperature of 80° with humidity of 30 per cent while Blackfan and his associates,[4] in seeking the optimum conditions for maintaining a constant body temperature of 98.6° found two points at which this could be done, (a) temperature of 80°, relative humidity 30 per cent, (b) temperature 77°, relative humidity 65 per cent, and stated that until more data was obtained, conclusions as to which was ideal, were not justified. Abt[5] gives 55 per cent as the optimum

humidity at 80° F., and Morganthaler[6] in describing a bed having an individual humidifier stated that it was kept at 80° to 85° with 50 to 65 per cent relative humidity and attributed the success of the bed to the fact that it was possible to maintain a normal humidity in the chambers.

Strict isolation of the premature cubicle is maintained at all times so that there is the minimum of contact with the remainder of the institution. Gowns and masks are provided, in the antechamber, for everyone entering the room, and no one is allowed to go in except in absolute necessity. The nurses looking after these babies have no other duties in order that there may not be the possibility of cross-infection. Despite all attempts at asepsis, however, we are not successful at all times, with the result that infections, particularly respiratory, continue to present the greatest problem.

Respiratory infections in premature infants are sufficiently different from those found in other infants to merit particular mention and some of our observations have cleared up problems that we could not previously solve. It was our not infrequent experience that babies who had been thriving would begin to show a slight rise in temperature with accompanying vomiting, diarrhea or abdominal distention and without any very positive physical findings to explain the upset. Some such patients died after a very short illness, while others, after a brief illness, resumed their normal course. (See Chart I.) After finding unsuspected bronchopneumonias at autopsy, we began to take cultures from both the nose and throat on all the infants. Most of those in good health showed only staphylococcus in the cultures, while the reports of those with the symptoms described almost invariably were returned from the laboratory with the notation that Micrococcus catarrhalis or a strain of streptococcus was also present. We therefore concluded that definite infections of the nose and throat might be present without our being able to see any abnormal congestion, that bronchopneumonia frequently resulted without marked elevation of temperature and that death followed before the physical signs in the chest became very evident. This failure of immature infants to localize and to resist infection was emphasized by Capper[7] in his review of 437 such patients. The susceptibility to infection of the respiratory tract is of course well known and has been spoken of by nearly every one who has had a large number of cases. In contrast, may be cited the experience of Cook[8] in California, who reported only four deaths from respiratory complications in a series of 77 prematures. This fortunate result was probably favored by climatic conditions.

As all the infants received daily doses of cod liver oil in what we felt to be adequate amounts (as well as irradiation with the quartz light twice weekly), there did not appear to be anything more to be done from a dietary standpoint to establish immunity. For a time we fed powdered brewer's yeast to see whether it would exert a favorable influence, but were unable to note any result as far as immunity to infection was concerned. The question of prophylactic vaccine therapy was then raised so this was tried on a number of infants. A mixed catarrhal vaccine was given in increasing doses without apparent beneficial results and it occasionally caused reactions which were highly undesirable.

Cod liver oil of high vitamin D potency has been added to the formulas at the time of their preparation in the formula room in the

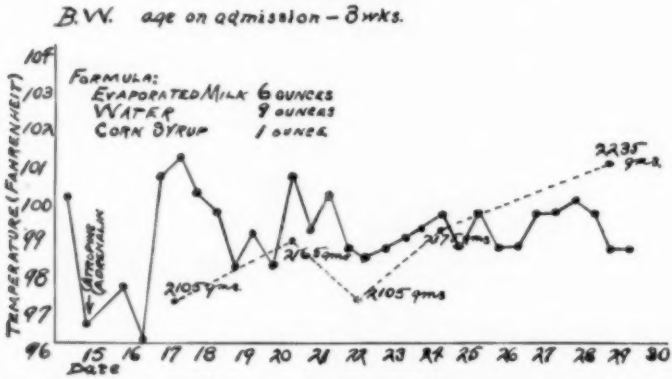

Chart I.—Showing the effect of upper respiratory infection upon the weight curve of a premature infant.

proportion of a dram to each pint of breast milk, or two drams to the pint in evaporated milk mixtures. In this way each infant received a daily dose of the oil from the day of admission, the dosage depending upon its ability to take food. For a considerable time we had a roentgenogram taken of each baby's wrists and ankles when it was ready to leave the hospital and found that in practically every instance there was no evidence of active rickets either in white or colored infants. Hence we concluded that during the period of hospitalization our infants were protected by cod liver oil supplemented with irradiation by quartz light. The only exceptions seemed to be those babies who had severe infections lasting over a considerable period. In such infants craniotabes was marked and they did not respond to even increased doses of cod liver oil. We felt that in such

infants yeast seemed to cause a definite improvement in the calcification of the bones when given with the oil, probably due to the fact that the administration of yeast favors retention of calcium in the body as has been shown by Macy[9] and others in experiments on rats. Gerstenberger and Nourse[10] demonstrated that rickets could be prevented by small doses of cod liver oil and thought that their results were partly due to the fact that the oil was started early. Despite the pessimistic view taken by other observers,[11, 12, 13] who feel that rickets is an inevitable occurrence even with adequate doses of oil, it would appear that protection is secured where a good standardized brand of cod liver oil is started early and that the doses do not have to be large. After their return home there were four patients who developed severe rickets, possibly the result of mothers giving the oil at irregular intervals. One white child, however, required the persistent use of the quartz light to heal a moderately severe rickets that developed while it was receiving two teaspoons of oil daily.

Anemia has not been a prominent clinical finding so we have not felt that it was necessary to give iron to our patients routinely. To avoid handling, blood counts and hemoglobin estimations were not made except when special indications presented themselves. In the infants who were taking food well and gaining in weight the number who developed anemia of sufficient degree to be suspected on physical examination was practically negligible. When mild secondary anemia was suspected and verified by blood examination, the condition responded readily to the administration of small doses of saccharated ferrous carbonate given in the feedings. Contrasted with these, however, were the anemias that developed during the course of infections. They progressed very rapidly, the hemoglobin, and the red blood cell counts fell to low levels quickly, and they did not react well to the administration of iron. Transfusion of blood relieved the condition at once but it was often necessary to give small amounts of blood two or more times because we found that the benefit was only temporary while the infection continued. We hope at a future time to make more detailed observations based upon blood studies in a number of such infants. Mackay's studies[14] of nutritional anemia recently published give some very suggestive statistics on the effect of iron administration in forestalling infection during the period of "physiologic" anemia. As this anemia is especially evident in infants prematurely born, routine iron administration may prove to be of value here.

Chart II shows the weight curves of seventeen infants whose weight on admission to the premature ward ranged from about 1000 gm. to 2200 gm. As will be noted from a study of the individual curves ini-

Chart II.—Representing the growth curves of fourteen premature infants, who were fed breast milk with calcium caseinate and diluted evaporated milk with added carbohydrate. Three infants (*A*, *B*, and *C*) were fed only breast milk.

tial loss of weight is not constant, being shown only in six of the seventeen. This is doubtless explained by the fact that feedings were started on regular schedule within six hours of admission, while glucose solution (5 per cent) was commenced at once,[15] and in many, subcutaneous injections of normal saline or 5 per cent glucose solution were given because of inability to take fluids well by mouth.

In looking at the curves designated *A*, *B*, and *C*, it will be noted that there is a close parallelism up to the sixth or seventh week. They represent the growth of three infants receiving breast milk without any alterations except gradual increase in quantity up to the time mentioned above. In Chart III the same type is seen in curves *D*, *E*, and *F* where the gain in weight during the early weeks was very slight. This is due to the fact that on breast milk alone the infants

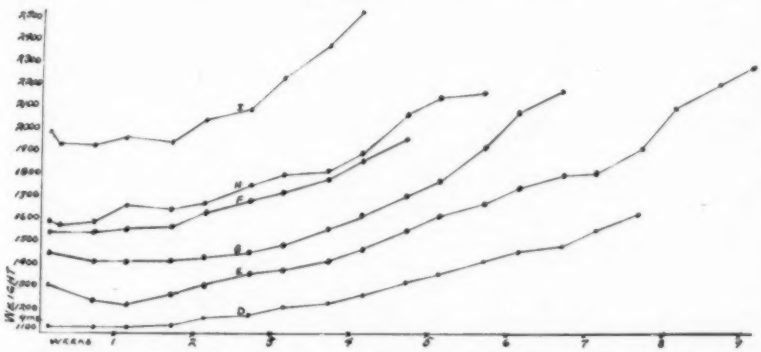

Chart III.—Infants represented by curves *D*, *E*, and *F* were fed only breast milk; *G* and *H*, breast milk followed by diluted evaporated milk with added carbohydrate, and *I* only evaporated milk formula.

are not able to take an amount of feeding sufficient in caloric value or protein content. That this is true particularly in the very smallest infants is illustrated by the curves *A* and *D*, while the patient represented by the curve *F* being larger, and consequently more vigorous, was able to consume sufficient breast milk, after about two and one half weeks, to maintain a very satisfactory gain. Their curves serve merely to point out that unmodified breast milk is not an entirely satisfactory food for the smallest prematures. They sleep almost continually and the nurse experiences difficulty in rousing them sufficiently to take food so in the early weeks three to four drams per feeding is about the most that can be given unless gavage is resorted to. Most clinicians agree that it is undesirable to disturb the infants for feeding oftener than every three hours, hence it may readily be seen that the caloric intake in twenty-four hours will not be sufficient

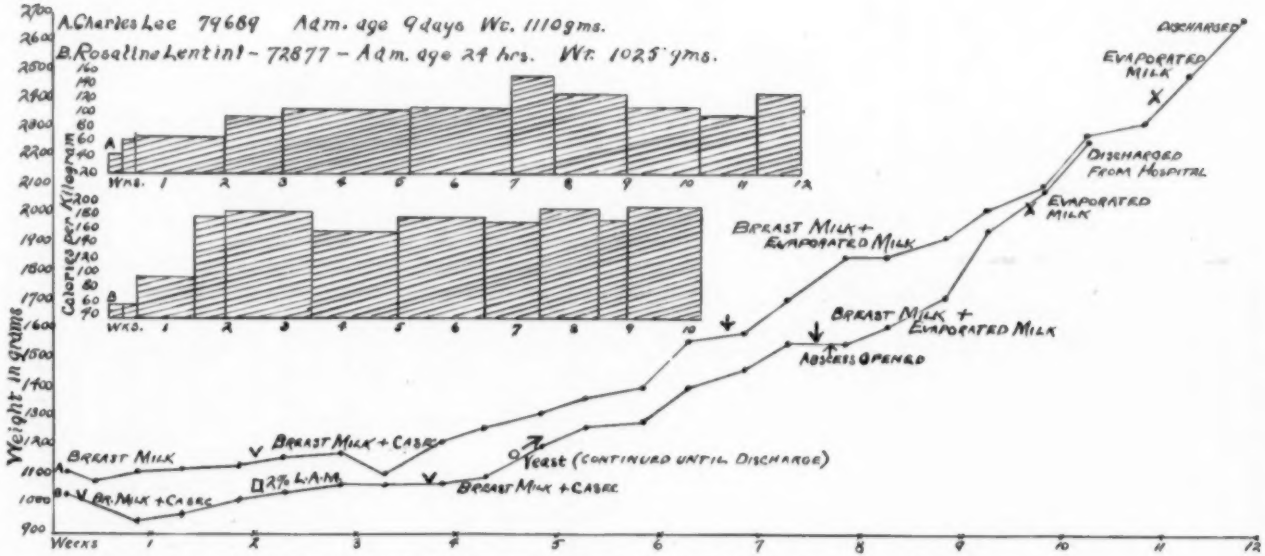

Chart IV.—Showing the growth, feedings, and caloric intake of two premature infants.

to more than maintain weight. Many methods have been used to remedy this defect, for example, reducing the water content of the breast milk by evaporation,[16] using dried breast milk,[17] or adding carbohydrate or protein.[18, 19]

We have found that the addition of 2 per cent calcium caseinate to the milk makes an extremely satisfactory formula for our small infants, and it is now routine practice in this clinic to use this high-protein breast milk on all infants weighing less than 1800 gm. until a satisfactory gain is established. After the infant is seen to be thriving, an evaporated milk formula is substituted in gradually increasing quantities until the breast milk formula is entirely stopped. The evaporated milk formula is continued during the remainder of the patient's stay in the hospital and afterward while it is being supervised by the out-patient department.

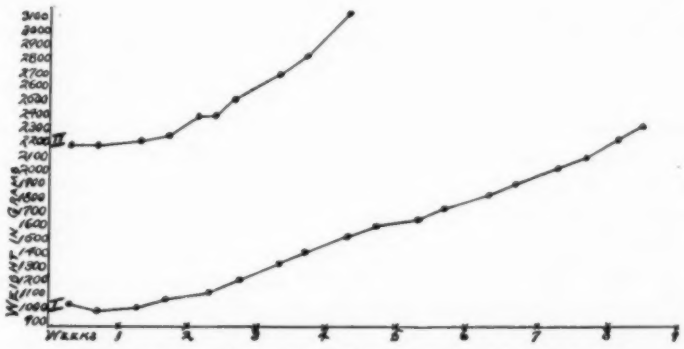

Chart V.—Illustrating the growth curves of premature twins.

Chart IV shows in a graphic way the progress of two patients and indicates the various changes that were made in the formulas. The first patient (represented by the lower curve) was admitted at the age of twenty-four hours, weighing 1050 gm. It was given high-protein breast milk formula and gained satisfactorily until the second week after an initial loss of 100 gm. Half skimmed lactic acid milk was then tried, but as progress was not satisfactory, the baby was again put on the breast milk formula. At seven and one-half weeks (1550 gm. weight) the substitution of diluted unsweetened evaporated milk with added carbohydrate was commenced until at about nine and one-half weeks (weight approximately 2000 gm.) a formula of one-third unsweetened evaporated milk, two-thirds water, with 5 per cent added carbohydrate was being used. The second

child was admitted at nine days of age weighing 1110 gm. Except for minor differences the plan of feeding was the same and the patient followed a course closely parallel to the first. The amount of food consumed by the first child was greater than that taken by the second throughout its entire course with a consequently higher caloric intake despite the close parallelism of their weights. This difference in prematures is frequently observed, many being able to gain quite satisfactorily on surprisingly small amounts. (See also Chart V.) Most of our infants received from 100 to 160 calories per kilogram and we have found that the majority gain well on 120 to 140 calories per kilo.[1] This figure is lower than many authors[8] feel is essential to proper growth in premature infants and we feel that the difference may be due to several factors, first, the nurse's ability to give plenty of water between feedings, second, a minimum of handling of these infants, and third, the relatively high protein content of the feedings.

Infants weighing over 1800 gm. are started directly upon diluted evaporated milk formulas if the mother is not supplying breast milk. We have found the majority of such babies gain very rapidly and do so with few gastrointestinal upsets. After trying out both acidified and nonacidified formulas we have gradually discontinued almost all of the acidified milk so that we are now using the acid formulas only when there is a special indication. The sweet formulas seem to be entirely satisfactory in almost every instance and the nurses report that there is less discomfort and less vomiting than when acidified milk is used. In beginning formulas of evaporated milk in such patients we have found that gastrointestinal upsets can largely be avoided by starting with a formula of one part of unsweetened evaporated milk to three parts of water with 7 per cent carbohydrate added and increasing gradually up to equal parts of unsweetened evaporated milk and water with the addition of 5 to 7 per cent carbohydrate. This can be done fairly rapidly so that gain in weight is not delayed and by gradual addition in this way the feeble digestive powers of the premature infant are not overtaxed.

As few of our mothers are able to supply sufficient breast milk during the entire time their baby is in the hospital, we find that the majority are getting part or all artificial feeding after the third or fourth week. By using unsweetened evaporated milk formulas a large sum of money has been saved because of our not having to buy breast milk. Referring again to Charts II and III, it will be seen that gain in weight is extremely satisfactory in the later weeks. Also in the weight curves of infants over 1800 gm., most of whom get evaporated milk formulas, it will be noted that the gain is very rapid,

averaging about 27 gm. per day with some gaining as much as 35 gm. per day. These figures are materially higher than those for infants receiving unmodified breast milk. By growing at this rate the child's hospitalization is shortened so that it can be sent home to be cared for by our follow-up service. In this way the premature population of the ward is kept to the minimum, which helps to reduce the chances of epidemics of respiratory disease.

Five thriving premature infants were given their regular amount of formula with barium added so that the progress of the meal could be observed with x-ray. Each child was given a test meal of breast

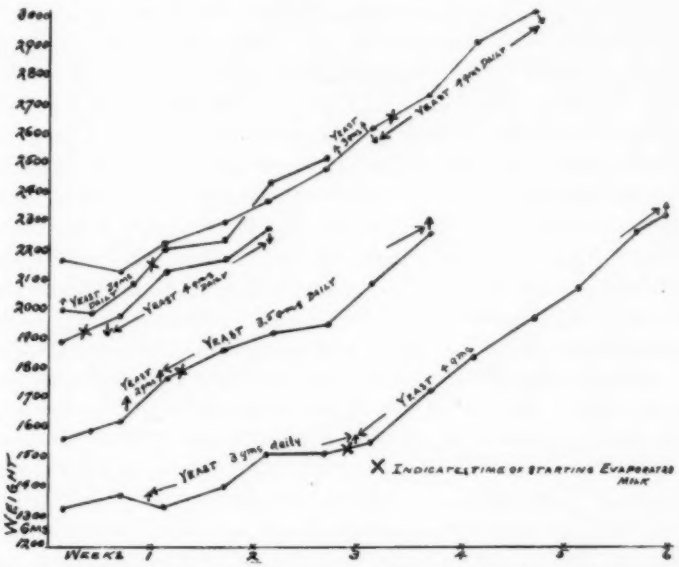

Chart VI.—Representing the growth curves of five infants who received powdered brewer's yeast in their diets.

milk and on another occasion a test meal of nonacidified evaporated milk formula so that the emptying time of the stomach could be determined with each type of feeding. We could see little difference between the breast milk formula and the evaporated milk formula in this respect, as a considerable part of the meal left the stomach within the first half hour and there was little remaining in the stomach at three hours. Samples of gastric contents for determination of hydrogen-ion concentration were also taken on three of these same infants two hours after measured test meals of breast milk formula and nonacidified evaporated milk formula had been given. Thirty determina-

tions (colorimetric method) in all were made, the range being from P_H 4.0 to P_H 5.0 with the majority being P_H 4.4 and P_H 4.6 for both types of feeding.

Chart VI represents the weights of infants who were given powdered brewer's yeast as an addition to the formulas of high-protein breast milk and evaporated milk. The average daily gain for this group was 25.3 gm., which is very close to the rate for those on evaporated milk formulas without yeast. Hess[20] and Bloxom[21] have demonstrated the effect of yeast upon growth, but in our infants the increase in the rate of growth was not striking so that the addition of yeast to the diet was not adopted as a routine procedure.

A survey was made by the social service department prior to January, 1930, which showed that few of the premature infants discharged from the hospital during 1928 and 1929 were living at the time the inquiry was made, and we assumed that this was due to the living conditions in the homes and the indifferent care that the babies had received. This led to the formation of our present follow-up service which has worked out admirably and resulted in a much different outlook for these babies in their homes. Two nurses devote almost their entire time to this work outside the hospital. They begin their contacts with the mothers immediately after a premature infant is brought in to the hospital. They strive to see that the mother is being properly cared for, they teach her the method of expressing breast milk and demonstrate its proper care prior to its being brought in for the baby's use. Repeated home calls are usually necessary as many of the mothers tire of collecting milk and start bringing it to the hospital at irregular intervals. Stimulation of the mother's breasts by massage is used along with dietary instruction to keep up the milk supply as long as possible.

Shortly before the baby is ready to leave the premature ward numerous calls are made to prepare the home for the baby's arrival. A cot or bassinet is prepared, suitable for a small infant. It is placed so as to be as close as possible to a constant supply of heat and away from windows and doors so as to minimize drafts. Directions are given regarding the proper temperature and humidity of the rooms, and the necessity for isolation of the patient is stressed.

As soon as the home preparations are completed the mother is brought to the ward where thorough instruction is given in handling the baby. The proper method of bathing, and feeding the infant is taught her, as well as the preparation of the formula if the child is not to be fed entirely on the mother's breast milk. Sufficient formula is sent home with each infant to last for twenty-four hours.

The number of home calls necessary, after the patient leaves the ward, is determined by the circumstances in each case. The average is six calls during the first week following discharge, three during the second week, two during the third and fourth weeks, with one call weekly thereafter as long as it is deemed necessary, depending upon the progress of the patient and the cooperation secured in the home. The babies are brought back to the out-patient clinic every two weeks for the first two months, then once a month until they are a year old, after which the visits are made only every two months. In the clinic weights and measurements are taken, feedings checked, cod liver oil and orange juice (or tomato juice) increased as needed.

Most of the illness in the homes has been the result of respiratory infections, or the acute specific infectious diseases. In the two-year period there have been only six infants readmitted to the Children's Hospital, and one admitted to the City Contagious Hospital. There were three deaths at home in the same length of time, one due to diarrhea (after leaving Detroit), one expired very suddenly and we were unable to determine the cause, while the third child apparently choked to death when left alone with its bottle.

We feel that these results in caring for a group of seventy premature infants under rather indifferent home conditions have been highly satisfactory. There has been a very noticeable improvement, too, during the second year of this routine as compared with the first, despite the fact that aid from the welfare department to many of these families had been greatly reduced. In the last twelve months there have been thirty-eight infants discharged with only two readmitted and no deaths at home.

Our infants who have reached a year or over compare very favorably with children born at full term as Fig. 2 will help to show. More than half of them reach accepted standards for weight and height at a year, and practically all of them do so before one and a half years of age. As regards their ability to sit up, to walk, and to begin saying words we have not noted any particular delay. Quite striking, however, is the slowness in dentition. It is unusual for any teeth to erupt before the ninth month, and it is often as late as the eleventh or twelfth month before they appear. We feel that this bears a direct relation to the degree of prematurity and that the period up to their normal birth time should be taken into consideration before deciding that the teeth have not erupted at the average time.

One of our children is definitely a Mongolian idiot, another who had an occult spina bifida is not making normal progress mentally, and there have been two deaths in the ward of the infants on whom a diag-

nosis of cerebral injury with spasticity was made. It would appear, therefore, that arrested cerebral development has not played a very conspicuous part in the infants who have survived. Capper[8] in his résumé took a rather pessimistic view concerning the mental development of this type of child and found a much higher percentage showing evidence of cortical injury. He also pointed out the tendency of the premature to spontaneous hemorrhage. We have had one death of bleeding from the cord stump in an infant, which could not be stopped by transfusion. In two other instances bleeding was quickly arrested by small amounts of blood given intravenously before alarming symptoms appeared. There was no recurrence of hemorrhage in either child.

Fig. 2.

SUMMARY

During the last two years we have been striving to develop methods of care for our premature (and immature) babies which would (1) reduce the mortality among these infants after their return to their homes, and (2) decrease the cost of their care while in the wards of the hospital.

The former has been accomplished by close supervision of the home care, made possible by our two visiting nurses and by frequent check-ups in the out-patient clinic. There have been seventy infants cared for in this way with most gratifying results. When present economic conditions are taken into consideration the improvement in the mortality at home becomes even more outstanding. A great many of these families are entirely dependent upon the city welfare organizations for support, which means that only the bare necessities can be procured.

The reduction in cost to the hospital has been accomplished by the persistent efforts of the nurses in having the mothers bring in their

breast milk, by the early substitution of evaporated milk formulas where the mother is unable to supply enough breast milk, and by sending the infants home when they reach five pounds (approximately 2300 gm.) in weight.

As has been previously stated, 35 per cent of all our admissions of premature infants die within forty-eight hours of the time of arrival, while 8 per cent are in an obviously moribund condition when received. This unfavorable situation could doubtless be improved by educating the attending physicians and the laity in regard to the necessity of greater care in handling premature infants, and possibly also by making available a heated carrier for use in an ambulance such as the one devised by Hess[19] and found very satisfactory in Chicago. The need for such information and care is emphasized by the fact that among the infants who died 68 per cent had a rectal temperature of 97° F., or below, while in only 23 per cent was the temperature between 97° and 100° F.[1]

CHART VII

CAUSES OF DEATH

(After 48 hours from time of admission)

	PER CENT
Prematurity	44
Acute respiratory infection (Including bronchopneumonia)	22
*Diarrhea	6
Inanition	3
Birth injury	5
Fetal atelectasis	3
Gonorrheal opthalmia	2.5
Congenital abnormality of heart	2
Hemorrhage	1
Syphilis	1
Spina bifida and other abnormalities	2
Erysipelas	0.5
Moribund on admission	8
Total mortality (after 48 hours) 1930	44
Total mortality (after 48 hours) 1931	33

*Most of these were parenteral diarrhea due to respiratory infection.

A study of the causes of death in our series shows that in 44 per cent we were unable to find any other cause than prematurity to account for their demise. The less, of course, will be the chance for survival, the smaller the baby and the greater the degree of prematurity, so that in babies weighing 1000 gm. or less the mortality is about 95 per cent.[22, 23] Respiratory infection caused 22 per cent of our deaths, the number dying from this cause being much higher in the cool months than in the summer. The deaths ascribed to gonorrheal ophthalmia are the result of the handling and exposure made

necessary for proper treatment of the eye condition. The intestinal upsets were practically all due to infection of the respiratory tract, but as diarrhea was the most prominent symptom the deaths have been listed under that heading.

During the two-year period there have been fifty-two premature infants admitted to the general wards of the hospital because they were suffering from some type of infection when admitted, and of these forty died (77 per cent). The mortality among the babies admitted to the special premature room, exclusive of those dying within the first forty-eight hours after admission, was 44 per cent during 1930, and 33 per cent during 1931.

CONCLUSIONS

1. The supervised care of premature infants in their own homes has proved very satisfactory.

2. The mortality in the posthospital period has been reduced by this method.

3. The period of hospitalization has been shortened with consequent reduction of cost.

4. Rickets can be prevented in premature infants by small doses of cod liver oil (supplemented by ultraviolet irradiation) if started early.

5. Breast milk with added calcium caseinate has been found the most satisfactory feeding for infants under 1400 gm. in weight.

6. Infants over this weight thrive well when a diluted unsweetened evaporated milk formula, with added carbohydrate, is gradually and carefully substituted for the modified breast milk.

7. Nonacidified evaporated milk has been found satisfactory for the larger prematures and during the period of after-care in the homes.

8. Gastrointestinal upsets were of infrequent occurrence in infants who were not suffering from infection.

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A TRIAL OF TOXIN-ANTITOXIN FLOCCULES (TAF) IN IMMUNITY AGAINST DIPHTHERIA*

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WE WISH to draw attention to a method of immunization against diphtheria which has apparently not been hitherto used in this country, although it has been one of the accepted methods in Germany for over five years, and appears to possess certain advantages over other methods. At present we do not, however, intend to advocate its general adoption but merely to present our results for consideration.

TAF† (Toxin-Antitoxin-Flocken, or floccules) is a suspension in physiologic salt solution (with 0.5 per cent phenol added) of a precipitate formed from the mixture in optimal proportions of diphtheria toxin with diphtheria antitoxin. The floccular precipitate, separated by centrifuging and thoroughly washed, consists of (a) the toxin principle united with the antitoxin principle, fully neutralized, and some globulin; (b) the protein of the diphtheria bacillus united with the corresponding precipitin from the antitoxin serum; (c) magnesium-ammonium phosphate; and possibly other insoluble substances as yet unrecognized. It is important to note, first, that the floccules are insoluble and hence can be and are washed free of all soluble substances from the culture medium, of which crude toxin consists, and from the serum—usually of the horse—of which antitoxin consists; and, second, that the various components, particularly the toxin, of the floccules are so firmly bound or adsorbed to one another as to be entirely nonirritating and nontoxic when injected, to be dissociated with the greatest difficulty in vitro and very slowly in vivo.

TAF was designed and prepared for practical use and has been most thoroughly studied by H. Schmidt[1, 2, 3] of Marburg, on the basis of earlier studies by Ramon[4] and others of the specific flocculation of diphtheria toxin by antitoxin. The advantages over ordinary toxin-antitoxin of having a stable, insoluble, exactly neutralized product, free of most of the extraneous substances of toxin and antitoxin were manifest. Since 1926, TAF has been widely used in Germany where

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†TAF is manufactured by the Bayer-Meister-Lucius Behringwerke, now a division of the I. G. Farbenindustrie A. G. of Leverkusen, Germany. The material used in the present study was kindly supplied at our request by the American agents, The Winthrop Chemical Co., whose courtesy is herewith gratefully acknowledged.

it is regarded as one of the three standard methods of immunization. The dose is 1 c.c. of the suspension in salt solution and contains not over 15 Lf units of toxin.

While two doses are sometimes recommended, we wished to make as stringent a test as possible and in our series used but one. Children from the Stanford Children's Clinic, of all ages between nine months and fifteen years were selected on the basis of a positive Schick test. The average age was four and three-tenths years, the median age, five and three-tenths years. Thirty-one of the children were approximately one year old. Eight of the children had previously been given TAT without success. The Schick test after TAF, though planned at a six months' interval, was in a good many instances done later, owing to the failure of patients to return on time. The average interval was exactly seven months, the shortest five, and the longest thirteen months after inoculation. Simultaneously with the two Schick tests, skin tests for sensitization to horse serum were carried out in most instances. The results of the study follow.

Number Schick positive children treated with TAF	107
Number Schick negative on re-test	99, or 92.5%
Number having had previous TAT without success	8
Number of these Schick negative after TAF	7, or 87.5%
Number children tested with horse serum after TAF	104
Number children reacting negatively to horse serum	96, or 92.3%
Number children reacting positively to horse serum	8, or 7.7%
Of these 8	
5 reacted positively before TAF	
1 had not been tested before TAF but had had TAT previously	
1 showed only a slight reaction	
1, a congenital syphilitic, showed a moderate reaction	

DISCUSSION

As compared with the results reviewed by Thelander,[5] those with TAF are manifestly superior to those with TAT and approximately equal to those with toxoid. The contrast and comparison are further accentuated by the fact that in our TAF series but one injection was used, whereas with TAT there were three or four and with toxoid two or three. Ray's[6] toxoid series with but one injection gave only 84 per cent of negative Schick tests, an indication that TAF is actually superior to toxoid in immunizing power.

In our series, no local or general reactions were observed, which agrees with German experience. The injections themselves, consisting as they do of an inert substance suspended in normal salt solution are almost painless, in contrast with the sharp sting so often complained of with toxoid. The absence of reaction constitutes a distinct

advantage over toxoid which, even today, still produces a fair percentage of unpleasant if not often alarming local disturbances, especially in older children. Such reactions are undoubtedly due to substances, such as diphtheria bacillus proteins, which remain in toxoid but are removed by washing from TAF.

One of the great advantages of toxoid is its freedom from foreign serum and its consequent inability to set up a state of serum sensitiveness which may interfere with later injections of serum. With ordinary toxin-antitoxin, in which the toxin and antitoxin are present in soluble form and in which all the elements of the serum are present this risk has to be taken into account. In TAF, on the other hand, all the elements of the serum save those which unite with toxin or diphtheria bacillus protein in the insoluble precipitate are washed out before use, and the remainder must be extraordinarily minute. Our direct tests for horse serum sensitization show clearly that such sensitization is certainly rare; the only child showing a clearly marked reaction after and not before TAF was a congenital syphilitic.

The question of possible dissociation of toxin from antitoxin in TAF either before or after injection is one which must be seriously considered, since the amount of toxin contained in each dose is comparatively large. H. Schmidt has studied the subject exhaustively both in vitro and in vivo. He states: "Up to the present we have not been able to demonstrate a dissociation of toxin even under conditions of storage that were intentionally unfavorable." He found that it was not dissociated by freezing. The only rapid method of dissociation found by him was by additions of anatoxin (toxoid) in vitro or by simultaneous injections of anatoxin in vivo. Under ordinary conditions following injection, the dissociation is very slow. Thus, Schmidt was able to give the extraordinary amount of 3600 Lf doses of toxin in the form of TAF to rabbits—animals highly susceptible to diphtheria toxin—without any immediate harmful effect, although, much later, symptoms of intoxication gradually developed. In man, with the customary doses, no ill effects have been reported and are quite unlikely to occur, provided the necessary and well-understood precautions are observed. Of these, the most important are optimal admixture of toxin and antitoxin for precipitation, thorough washing, the use of fully ripened toxin and antitoxin, and adequate aging of the floccules. On the whole, it seems fair to conclude that the danger of dissociation has been well obviated in preparation and that there is an adequate margin of safety from the hazards of transportation and storage.

Because of the firmness of the toxin-antitoxin combination in TAF, it is more slowly broken down in the body and hence immunizes somewhat more slowly than either TAT or toxoid. At the moment we find

a comparative estimate for the three materials only in the German manufacturer's pamphlet, which gives the period of beginning immunity as twelve weeks, eight weeks and four weeks for TAF, TAT and toxoid respectively. Comparative figures on the times when the height of immunity is attained are not available for TAF, but our own data indicate that is probably reached within seven months.

CONCLUSIONS

1. In a series of 107 children of various ages (average four and three-tenths years), all previously Schick positive, 99, or 92.5 per cent, were rendered Schick negative at an average period of seven months after a single injection of TAF.

2. Sensitization to horse serum after TAF and not previously present did not occur in more than two cases in the series, and in one of these was slight.

3. No local or general reaction to TAF was observed and the injections were practically painless.

4. Of 8 children who had had previous courses of TAT without becoming Schick negative, 7 became Schick negative after one injection of TAF.

5. TAF has the advantage over toxoid of being freed from all soluble residues from the toxin culture medium and from antitoxin and of not containing formalin. It is equal in immunizing power to toxoid and perhaps somewhat superior.

6. Over TAT it has the advantages of greater immunizing power and, apparently, of a smaller probability of inducing sensitization to serum.

7. TAF appears to be highly stable and resistant to the dissociating effects of unfavorable conditions of storage and transportation.

8. Immunity from TAF probably begins somewhat later than that from toxoid or TAT, but, from our figures, appears to reach its height within a period of seven months or less.

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PEDIATRICS AND THE SUPERVISION OF CHILD DEVELOPMENT*

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DISEASE and development are related concepts. Pediatrics is compelled to reckon with both of them. Many childhood diseases affect development adversely and most forms of maldevelopment have a disease aspect. In all such instances the full protection of potential development requires medical assistance of some kind. In the supervision of the infant's nutrition pediatrics has brought the normal as well as the pathologic aspects of development within its range. This regulation of nutrition leads naturally into so many ramifications that we may well inquire what is the relation of pediatric medicine to the systematic supervision of child development. Does development as well as disease fall squarely within the scope of pediatrics?

Development is not a mystical concept. As Adami, the pathologist, aptly put it, development is a process quite as real as secretion. It is a biologic process which can be investigated by the same scientific methods used to build up our knowledge of secretions and of other functions of the human organism. Development or growth (these terms are virtually interchangeable) has become one of the foundation problems of experimental biology. Under laboratory conditions the processes of growth have been subjected to increasing analysis by chemical, electrical, and mechanical and surgical procedures. Even at the microscopic level, phenomena of normal and abnormal growth have been photographically recorded. The surgical attack upon problems of morphogenesis by embryonic grafting and transplantation in amblystoma and other forms has been remarkably ingenious and fruitful. Growth has ceased to be a completely elusive mystery; growth is now experimentally manipulated. It has been accelerated, repressed, and deliberately altered in manifold ways; and in the white rat at least it has been brought under a significant degree of predictive control.

Out of such work in the fundamental sciences grew our present knowledge of the factors of nutrition. A wider knowledge of the growth of the organism as a whole is evolving at an extremely rapid rate. Much of this knowledge is still in a preclinical stage so far as

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immediate application is concerned, but there can be no doubt that pediatrics will come into increasing command of biochemical and physiologic methods for the measurement, the diagnosis, and the partial control of early human growth.

It is not suggested that any considerable extension of pediatrics will come about with revolutionary abruptness. It is suggested, however, that the periodic, medical supervision of infant nutrition, which began meagerly only a generation ago, will continue to widen its scope and embrace the total developmental well-being of infancy. Problems of nutrition cannot be kept within purely dietary confines. They inevitably involve questions of a functional and psychologic nature. Nutrition cannot be successfully regulated except in terms of the behavior of the infant and sometimes also of nurse and of parent. Many feeding difficulties are behavior difficulties arising out of a family situation and the parent-child relationship. The technics of weaning, of supplementary feeding, the development of habits of independence in eating, repugnances and self-selection of food, all have a definite psychologic aspect. Moreover there are a host of minor behavior deviations like temper tantrums, thumb-sucking, enuresis, postural peculiarities, excessive fears and timidity, faulty habits of sleep, rest, and play which rise in the round of the physician's duties, particularly if he projects the early supervision of infant feeding into the later months and years.

For all these reasons the pediatrician is compelled to reckon with problems which involve the applications of developmental or of educational psychology. Without attempting to become an expert in mental hygiene it is possible for him to make these applications less incidentally and more systematically as part of his total task of health supervision. The report of the White House Conference subcommittee on Psychology and Psychiatry in Pediatrics* (Dr. Bronson Crothers, chairman) has indicated in conservative but constructive terms the opportunities of the child's physician in the field of mental hygiene.

The White House Conference Reports are notable for the varied and repeated emphasis which they place on the *mental* aspects of child health and protection. This is particularly true of the recommendations made by the basic section dealing with medical service. The subcommittee on Growth and Development of this section gives coordinate status to mental and physical growth problems. The subcommittee on Medical Education† outlines concretely a pediatric course and specifies "the

*_Psychology and Psychiatry in Pediatrics: The Problem._ Report of the Subcommittee on Psychology and Psychiatry, Bronson Crothers, M.D. Chairman. White House Conference on Child Health and Protection. The Century Company, New York, 1932, p. 146.

†_Pediatrics: Education and Practice._ Report of the Subcommittee on Medical Education. Borden S. Veeder, M.D., Chairman. White House Conference on Child Health and Protection. The Century Company, New York, 1931, p. 117.

material which is necessary, or essential in one way or another, in the education of the physician to the end that he may be able to give adequate care to the children under his charge." These "minimum essentials for the practitioner" include the physical and *mental growth* of infants and children, heredity, body types, posture, abnormal habits, habit formation, and related topics.

The reports of the conference show an unmistakable tendency to bring the problems of physical and mental welfare into close relationship. The very concept of development makes for such unification. The child organism is an integrated unit and from the standpoint of growth it is hazardous to insist too strongly upon the ancient dualisms of physical and mental, of structure and function, of health and disease, or even of nature and nurture. For convenience such distinctions may be made, but the whole trend of science is to resolve them into a more monistic point of view. The time is far past when the mind of the infant can be regarded as a separate entity detached from his total make-up.

The report of the White House Conference Committee on Special Classes deals mainly with the special education of handicapped children of school age.* It is the general practitioner, the family physician, the pediatrician, who in the vast majority of cases comes into first contact with these children. The developmental protection of the handicapped child of preschool age is in large measure a problem of pediatric medicine. The dimensions of the task are enormous as reflected by statistics for the country as a whole. The following figures relate to children of school age. Many of these children were seriously neglected from the standpoint of developmental supervision during their preschool years. A corresponding number are now of preschool age, dependent chiefly upon medical and public health agencies for protection.

In round numbers there are 300,000 crippled children, one-third of whom need special education. Some 10,000 are enrolled in public schools, state hospitals, and private schools.

There are one million school children between the ages of five and eighteen years so defective in speech that they require remedial treatment and training (60,000 of these are now receiving corrective treatment). There are three million children with impaired hearing, of whom some 18,000 are enrolled in schools and classes for the deaf. There are 50,000 with partial vision, who should be in sight-saving classes (5,000 of these are enrolled in such classes); and 14,400 blind children under twenty years of age, of whom 6,000 are being educated in state, private, or public day schools and classes.

*_Special Education of the Handicapped and the Gifted._ Report of the Committee on Special Classes, Charles Scott Berry, Ph.D., Chairman. White House Conference on Child Health and Protection. The Century Company, New York, 1931, p. 604.

There are six million children of school age classified as malnourished (40,000 of these are in open-air schools and classes); 382,000 are considered tuberculous, and 850,000 are classified as suspicious cases. There are a million with weak or damaged hearts (375,000 of these with serious organic heart disease).

Three per cent of the elementary school enrollment, or about 675,000 children, present behavior problems (10,000 of these children are in parental schools and special classes). There are 450,000 pupils in elementary grades mentally retarded to such a degree that they require special educational provisions. Sixty thousand of these are enrolled in special classes.

Many of the foregoing handicaps date from birth or early infancy. About one-third of the juvenile crippled and blind, about three-fourths of the deaf and speech defective, and practically all of the mentally subnormal come by their handicaps during the preschool years.

These figures in the aggregate reveal the strategic opportunities of preventive and developmental pediatrics. A large proportion of the defects enumerated can be prevented or ameliorated. Those which cannot be remedied are equally in need of consecutive medical supervision and guidance. A handicapped child must be early understood with respect to his limitations as well as to his positive potentialities. Often the adjustment of the parent to the handicap becomes the most serious aspect of the problem for the physician.

In all these situations the pediatrician is very likely to play a critical rôle, for he, or the general practitioner, is the first to be consulted. He has the opportunity to make the early diagnoses, to bring about the most timely prevention, and to furnish responsible guidance. He may call in the assistance of specialists, but it is impossible to see how he can escape the professional application of at least the elementary principles of mental hygiene in his supervision of children of preschool age.

If it is argued that this widens too much the scope of pediatrics, it may be answered that pediatrics is essentially a perpetuation of general medicine. In an age of multiple specialization its function is to maintain a coordination of medical resources in the interests of the indivisible child. The very successes of modern medicine have made the treatment of frank and acute disease less dominating than it was in a generation past. The protection and the promotion of optimum child development is a formula which expresses the more inclusive goal toward which pediatrics is tending.

If this thesis is tenable it means that *mental growth* as well as physical growth will inevitably come within the range of pediatric supervision. Biologically, the mind is part and parcel of the unitary organism, intimately bound up with the structure and the development

of the nervous system. Even in the fetal period the nervous system integrates the life of the organism and organizes its growth. This life expresses itself not only in progressive embryologic changes in the somatic organs, but it expresses itself in progressive changes of patterns of behavior. Mental growth becomes scientifically as tangible as physical growth if we think of the developing mind in terms of such objective patterns of behavior. These patterns are open to scientific investigation. They are molded into characteristic forms by virtue of the same laws of growth which account for the orderly morphogenesis of the nervous system. These patterns are the index of the maturity and status of the nervous system.

From the first movements of the fetus to the assumption of erect posture the action systems of the organism display patterning. There are patterns of specific reflex behavior, patterns of totalized, integrated response, and patterns of ontogenetic sequence. There is no such thing as utter randomness in infant behavior. Even the sprawling of the eight-week-old infant is distinctive from that of the twelve-week-old. This distinctiveness arises out of a deep-seated developmental difference in the patterns of posture and of perception. The organization of the growing complex of infant behavior is faithfully revealed in outward forms of posture, of perceptual adjustment, prehension and adaptive manipulation.

It is possible to capture these visible behavior forms by means of photography. By careful study of such photographic records it is likewise possible to build up an outline of the progressive differentiations in behavior forms. The growth of the mind is to this extent made tangible. This growth manifests itself in characteristic modes of behavior which can be formulated into normative criteria for appraisal of the maturity of the nervous system. I may briefly indicate here the methods which have been developed at the Yale Clinic of Child Development for the cinematographic inventory and charting of the growth of behavior patterns in the human infant.*

Our subjects are normal infants selected as to race, gestation period, health, parentage and socio-economic factors. Twenty-five or more children have been examined at lunar month intervals from 4 weeks through 56 weeks of age. The infants were observed in a specially designed clinical crib, under controlled conditions. The data include stenographic and cinema records covering the fields of posture, locomotion, prehension, manipulation, attentional regard, exploitive and adaptive behavior. This behavior survey has been in progress for five

*This charting is being codified in "A Photographic Atlas of Infant Behavior Patterns," embodying normative criteria for the study of constant and variable features of mental growth. Published data are in the author's *The Mental Growth of the Preschool Child.* Macmillan, New York, 1925, p. 447. *Infancy and Human Growth.* Macmillan, New York, 1928, p. 418. *The Guidance of Mental Growth in Infant and Child.* Macmillan, New York, 1930, p. 322.

years and has been accomplished through coordinated studies by research members of the staff of the clinic.

The developmental observations are made somewhat as follows: For example, if we wish to record the patterns of prehension in a 24-week-old infant, he is placed, with a supportive band, in an adjustable chair in front of a table top which rests on the rails of the crib mentioned above. The crib is housed in a softly lighted, circular domelike room, which is equipped with motion picture cameras. The whole structure is enclosed from one-way-vision screen. By this screen the infant is protected from seeing the observers outside the dome, but these unobserved observers can see his reactions clearly. A one-inch cube or a small pellet 0.7 cm. in diameter is placed in a standard position on the table top and as soon as the child reacts the camera begins to operate. For every 10 seconds of behavior the film records 160 separate photographs all in sequence.

The behavior pattern thus recorded may be minutely analyzed by inspection of each individual photographic frame. This is accomplished in our laboratory by a specially constructed projection desk operated by hand, permitting the image to be repeatedly viewed at will, in full and slowed motion, and in stilled pattern phases. From such pictorial records, and associated data, we derive norms of behavior which may be applied in the diagnosis of developmental status.

To illustrate: An infant 24 weeks of age was recently brought to the clinic for developmental examination. He had a complicated birth history and the parents were somewhat concerned about the possible effects of a prematurity of 8 weeks with a birth weight of 3½ pounds and retarded neonatal physical development. At the time of the examination the infant had attained a weight of 14 pounds and was vigorously reactive though he showed no desire to sit up. He was placed in the supine position in the clinical crib and his spontaneous behavior was then observed. The observations may be briefly summarized in the present tense as follows:

> He lies with head in the midline and maintains this midposition for prolonged periods. He rotates the head freely and turns it fully from one side to the other. Only traces of the tonic neck reflex are seen. His arms are symmetrically active; they are predominantly flexed and the hands are usually fisted. His legs are acutely flexed at the knees and the hips externally rotated. He rolls freely to the side without assistance. He is regardful of his surroundings. He brings his hands to the midline where they engage. . . . He perceives a dangling ring when it is presented in the midline and gives it immediate and prolonged regard. While he inspects the ring he brings his hands together over his chest but he does not prehend the ring. He repeatedly follows it with his eyes and over a distance headward and forward and through an arc of 180°. He shifts his regard to the examiner's hand which holds the ring. When the examiner places the dangling ring in his hand, the infant regards it and carries it to his mouth. . . . When pulled from the supine to the sitting position he tenses his shoulders and shows no head lag.

In the above summary we have a thumb-nail sketch of the patterns of behavior as they actually occurred during fifteen minutes of observation. These patterns are unquestionably less mature than we have a right to expect in an average 24-week-old infant. They are less mature than those of the 20 weeks' level, but they are definitely more mature than those of a normative 12-week-old infant. They are, in fact, highly characteristic of the 16 weeks' level. But this infant was 24 weeks of age.

Ordinarily a retardation of 8 weeks at a chronologic age of 24 weeks would be a seriously unfavorable condition, and might even be predictive of a high-grade mental deficiency. In the present case, however, the behavior picture as summarized is normal and represents a fictitious degree of retardation arising out of the 8 weeks of prematurity. The parents were assured that the developmental outlook is favorable. They were also advised to restrain their tendency to overstimulate the child's development to make up for the prematurity.

This case has been summarized to indicate the applicability of behavior norms to problems of developmental diagnosis. Comparable procedures can be applied to a wide range of conditions to determine the trends, the rate, the maturity, and the deviations of development.

If mental growth is to be supervised, norms of some kind are indispensable. They are as essential for the early diagnosis of developmental status as are standards of weight and height in the supervision of physical growth. Norms must, of course, be used with clinical caution. Whenever there is any doubt, a developmental diagnosis should be made to rest on cumulative, consecutive observations. Development is a continuing process which can be supervised only by periodic examinations. Properly used, norms of behavior development will lead to an earlier detection of preventable handicaps and to a more complete recognition of the interrelations of mental and physical welfare.

Periodic health examinations and a periodic survey of behavior patterns can be brought into association in a supervisory type of developmental pediatrics directed toward the more timely control of growth conditions. The demand for this type of pediatrics is becoming clearer, both in the fields of private practice and of public health. Systematic health supervision is only in its beginning, but in principle a revolutionary increase in medical and social control has already been achieved. How this supervisory service in infant hygiene will actually be organized no one can, of course, predict in detail. The methods of *developmental pediatrics* will naturally take shape slowly, but probably with the same steady and sound growth which has marked the advances of preventive pediatrics in the supervision of infant nutrition.

This paper does not attempt to consider the relationship of "developmental pediatrics" to psychiatry, to clinical psychology, to child

guidance clinics, and to other agencies now operating in the field of infant training and hygiene. In this whole field which is now in a highly transitional stage of organization, pediatrics holds a peculiarly strategic position representing the integration of the resources of general medicine in the health protection of normal as well as sick infants.

In the next few decades research in the biological sciences will doubtless perfect new and discriminating technics for the measurement and clinical appraisal of human characteristics, mental and physical. Such technics will define with greater precision individual differences in body build, constitutional type, and biochemical qualities and susceptibilities; physiologic efficiencies of separate organs; behavior traits and trends; and above all, the balance or correlation of different functions in the total personality.

In some way these technics, medical and biometric, will be systematically used for the better control of early human growth. How will they be applied? As separate and independent specializations? Or will they be coordinated in a form of clinical medicine which will bring the total development of the infant under periodic supervision?

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UNDULANT FEVER IN CHILDHOOD*

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UNDULANT fever is an infectious disease which we now know is communicated to man directly or indirectly from animals. Infection of the human being takes place through contact with the living or dead animal or by the ingestion of the milk or milk products of the diseased cow or goat. The animal represents the reservoir of infection. The observation that at times it is a milk-borne disease, causes it to become a subject of pediatric interest. The recognition of the importance of the detection of this disease in adults and children and the evident need of its further study from veterinary, medical and public health standpoints, has furnished the incentive for the vast amount of work on this subject which has developed during the past ten years. This is illustrated by the statement of Karl F. Meyer, that during the past year (1931-32) 781 publications appeared in the literature on abortus and melitensis infection in man and animals.

Two discoveries in the field of bacteriology made it possible to explain the relation of the disease in animals to that occurring in man. Bruce[1, 2] in 1886 recovered an organism from the spleen and later from the blood of individuals, on the isle of Malta, suffering from a febrile disease prevalent on that island. He designated the organism as the Micrococcus melitensis. It is now called after Bruce, the Brucella melitensis. This disease was characterized by its long duration, by sweating, splenic enlargement, joint pain, undulating type of fever and weakness, and relatively low mortality. Marston,[3] as early as 1861, had fully described the clinical picture of this infection. Bang[4] of Copenhagen demonstrated (in 1897) that infectious abortion in cattle was due to a specific organism, the Bacillus abortus, or as it is now known, the Brucella abortus. The abortus organism is discharged from the uterus and mammary glands of infected animals. A large proportion of cattle once infected probably harbor the bacillus for a lifetime and continually, or periodically, eliminate it with the milk. These two scientific discoveries, apparently in widely different fields of medicine, were coordinated by an exhaustive piece of work by Alice Evans[5] of the United States Public Health Service. She demonstrated the close relationship between the Brucella abortus and Brucella melitensis and furnished the proof that the Brucella melitensis and Bru-

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cella abortus are varieties of the same bacteriologic species, and that they can be differentiated only serologically by the agglutinin absorption test.

Contagious abortion occurs in several animals, and, depending upon the animal from which the organism is recovered, a number of varieties of Brucella abortus have been isolated. Generally speaking, we now recognize a bovine, porcine, and a melitensis or caprine strain of Brucella abortus. This statement later on will need to be somewhat modified.

The bovine infection is world-wide in extent and in the United States relatively few dairy herds, unless steps have been taken to eliminate it, are free from abortus infection. The melitensis, or caprine, strain is represented by infected goats in the southwest section of this country. The porcine strain occurs particularly in the swine of Kentucky, Iowa, Missouri, California, Wisconsin and Illinois. The etiology of the disease, however, has been further complicated by the fact that these different strains are not necessarily confined to the animals which originally acted as hosts. Experimentally, Carpenter[6] succeeded in infecting cattle with the porcine strain. Evans and others successfully implanted the melitensis variety into cattle. It is evident, therefore, that it is possible for an individual to contract the disease from cattle, yet the infection may not be due to the bovine strain. The possibility should not be ignored that in exceptional instances the infection may be due to an aberrant porcine or melitensis strain which has localized in the udder of the cow. Conclusive epidemiologic evidence covering this possibility has not been furnished. Further careful studies concerning the source of the organism in cases of undulant fever in which a peculiar Brucella abortus has been isolated, are necessary before we can state this to be a fact.

Theobald Smith in 1894 called attention to a peculiar disease occurring in guinea pigs inoculated with milk which resembled tuberculosis. In 1911 he,[7] in association with Fabyan, determined that these lesions were due to Brucella abortus. Larson and Sedgwick[8] in 1913, working with the agglutination and complement-fixation tests for Brucella abortus, suggested the possibility of human infection. Fleischner and Meyer[9] in 1917, in attempting to determine the presence of tubercle bacilli in certified milk by injecting guinea pigs with milk, were surprised to find that the animals at necropsy after twelve weeks showed enlarged spleens studded with greyish nodules, general adenopathy with no caseation, and atrophic testes. No acid-fast bacilli were recovered. The condition was then recognized as abortion disease in guinea pigs. In their conclusions they state: "The result of this work, however, is a more definite indication that it is of the greatest

importance to study the abortus problem from every angle to be absolutely certain of its bearing on the health of infants."

It remained for Keefer[10] of Baltimore, who in 1924 reported his case of abortus infection in man, to fully establish the fact that the Brucella abortus, other than the Brucella melitensis, was pathogenic for the human organism. A few years later Carpenter was able not only to isolate the abortus organism from the blood of a human case, but he also recovered the same strain from the milk consumed and with this strain was able to produce abortion in cattle.

Hardy states that in the year 1925 only 24 cases of abortus infection in man were reported in the United States, as against 1505 cases in 1929. Clinical studies during this period have taught us that the symptomatology of this disease does not enable us to differentiate the infections due to the various strains of Brucella abortus. An infection caused by the bovine or porcine variety may not be distinguishable clinically from an infection due to the Brucella melitensis.

Epidemics of the disease caused by the bovine or porcine strain have not been reported to date, while Malta fever, the form caused by the melitensis or caprine strain, has at times assumed epidemic form in the Mediterranean regions, France, in Phoenix, Arizona, and Candeloupe, 1911.

Aublant, Dubois, La Fenetre and Lisbonne[11] state that the menace to France of undulant fever was recognized to be so great that a survey conducted in 1923 led to the conclusion that three to four thousand people had suffered from the disease between 1920 and 1923 and that it was on the increase. Denmark made Bang's disease reportable in 1927 and it was soon noted that its prevalence exceeded that of typhoid and paratyphoid combined in that country. The infection with the bovine type of Brucella abortus infection in man is frequently designated as Bang's disease. Hardy[12] states that in Iowa abortus infection is comparable to typhoid in extent. McAlpine and Mickle[13] in Connecticut examined 20,259 sera sent in for Wassermann tests for Brucella abortus agglutinins and found 0.6 per cent positive with a complete reaction through the 1:100 dilution. This dilution is now considered pathognomonic of Brucella abortus infection. Orr and Huddleson[14] inform us that: "in their study of a group of 500 individuals of all ages constantly exposed to the abortus organism through an infected milk supply only 1.4 per cent showed evidence of infection with the organism and only 0.8 per cent showed evidence of active infection. These results would indicate that among the human population susceptibility to infection to Brucella abortus (bovine type) is very low and that human infection is determined by some factors as

yet undetermined." An examination of the serum of 530 adult individuals known to have drunk raw milk containing living Brucella abortus from a single herd in which 54 per cent of the animals were infected showed 13 per cent to contain specific agglutinins for Brucella abortus. (E. M. Carpenter and M. J. King.[15])

DiCristina and Maggiore[16] state that 2,068 febrile cases were treated in the hospitals of Palermo in 1917 and that 936 of these were ascribed to melitensis infection. They described the clinical types seen in infants and young children as hyperpyrexial, undulant, splenomegalic, biliary, adynamic, rheumatic, nervous and renal. The undulant type was not very frequent. Sweating and splenic enlargement were very common findings. This type, they state, does not tend to be very severe. In the biliary type associated with jaundice, the organism probably localizes in the bile and the prognosis is grave. The nervous type they found very common in infants and young children often presenting signs of meningitis, encephalitis and bulbar signs. In connection with the above it is interesting to state that the British Commission and Amoss[17] succeeded in isolating the Brucella abortus from the bile and gall bladder. Desage, Pellerin and Vincent[18] report the case of an eighteen-year-old girl who, after a febrile attack of four months developed meningitis. Brucella melitensis was isolated from the spinal fluid. Vaccine therapy was instituted. Recovery took place. Cozzolino[19] draws attention to cases of undulant fever in children. He collected 41 cases and added 7 of his own. The duration was three months to one year. Mortality was 6 per cent. He noted arrested development and some degree of mental deficiency in several instances.

The recent work of Pablo Morales-Otero[20] of Porto Rico furnishes us some very interesting and important data. He was able to procure 40 human volunteers for his experiments. Of these 40 men inoculated by various methods and with various strains of Brucella abortus, 10 contracted the infection. Of these 10 successfully inoculated, 6 became infected through the abraded skin and 4 by way of the gastrointestinal tract. Of the 6 positive infections via the abraded skin, 3 were due to the bovine strain, 1 to the melitensis strain and 2 to the porcine strain. A single dose was sufficient in each instance to produce the infection. Of the 4 who contracted the disease after being inoculated through the gastrointestinal tract 2 had received the porcine strain, 1 the melitensis strain and 1 a bovine strain. A single dose of the melitensis variety was sufficient to produce infection but it required two or more doses of the porcine variety and seven consecutive doses of the bovine strain to produce a mild case of undulant fever. A twenty-four-hour broth culture of the various organisms was employed.

The incubation period was 10 to 17 days. Blood cultures were obtained in all but one case between the fifth and eleventh day. The agglutination test was positive in all but one case, the earliest on the tenth day and others not until the twenty-third day of the disease. Leucocyte counts were below normal with a decrease in the number of polymorphonuclears and an increase in the mononuclears.

He gives the symptoms and physical findings which occurred as follows: The onset is generally gradual, temperature develops, increases in the afternoon and is generally lower in the morning. On the third or fourth day the patients complained of headache and pain all over the body. These symptoms may continue for several weeks, the fever may decline or even reach normal for a few days and then the relapse occurs with much the same symptoms. Frequently there was some complaint of sore throat and tenderness in the epigastrium followed by bronchial catarrh, enlargement and tenderness of the spleen, weakness, a feeling of heat generally in the afternoon, and sometimes anemia. The joints at times became swollen and painful. Insomnia and hysterical emotions were not uncommon. Sudamina were the rule. Gradually the symptoms abated, remissions lengthened until the temperature became normal and convalescence set in after months. Among the complications which he noted were orchitis, diarrhea, bronchitis, pleural effusion, cardiac failure and hyperpyrexia.

We became interested in the abortus problem when about four years ago we came in contact with several instances of the disease in young children and also because our certified milk was being jeopardized by the presence of a large number of reactors in the herds. The Los Angeles County Certified Milk Commission at the instigation of, and with the assistance of, Karl Meyer had already at this time initiated a survey of the herds for B. abortus infection.

The first survey of the certified milk herds of Los Angeles County was undertaken in 1927. The sera of almost 3,000 cows were tested and of this number 35.7 per cent gave positive reactions for B. abortus. This figure represents the natural incidence before any protective measures were instituted. The work of cleaning up these herds and keeping them clear of reactors has been carried on systematically since that time with the result that for the first three months of 1932 we found only 0.34 per cent of positive reactors.

In the course of this work it was also observed that as long as the herds showed over 1 per cent of reactors, guinea pigs inoculated with the milk, at necropsy showed evidence of abortus infection. Since the reactors in the herds have dropped below 1 per cent guinea pigs injected with the milk have all been negative.

During the year 1928-1929 the Veterinary Science Laboratories of the University of California at Berkeley and Davis (Hayes)[21] tested over 15,000 blood samples of cattle for the presence of Bang's disease. Positive reactions were obtained in 16 per cent of these. Some herds were comparatively clean while others showed 60 per cent to 70 per cent of reactors. It is now believed from data obtained in this and foreign countries that from 25 per cent to 45 per cent of cows are infected with B. abortus. In Los Angeles County 50 per cent of the milk consumed is represented by pasteurized milk, 1½ per cent by certified milk and 48½ per cent of all milk reaches the consumer as raw milk. This represents the output of about 15,000 cows. Loeffler estimates that 60 per cent of all infected animals continually or periodically shed B. abortus in their milk.

In Los Angeles County for the period 1927-1931 inclusive about 106 cases of undulant fever were reported. Of this number there were only 7 children under ten years of age, or approximately 7 per cent. There may be a slight inaccuracy in these figures, due to duplication in the city and county reports.

Wainwright[22] collected 82 cases including 8 of his own and reports 7 of these as occurring in the first decade of life. Two of his cases were due to the melitensis strain.

Hardy[23] reporting 125 cases found only 3 during the first decade and none under four years of age. Alice Evans[24] collected 65 cases, 6 of these in children under fifteen years, the youngest being four years old. She comments as follows: "Does this indicate a natural immunity in children? Or is there some special difficulty in recognizing the disease in children?" Carpenter and King[25] in their discussion of 155 cases mention only 2 individuals under six years of age. Kristensen's[26] figures (see Table I) based on 1,647 cases collected in Denmark best illustrate the part played by age in the incidence of B. abortus infection in man. Here again we note only 3 cases occurring under five years of age and also the very striking increase in the number of infections at the time of adolescence. Kristensen states that in less than 35 per cent of cases is milk the sole source of infection, and that when the two factors, milk and contact, coexist, contact is probably the most important factor. This also is the viewpoint of their investigators and is supported by the observation that the disease is particularly prevalent among farmers, butchers, veterinarians, packing-house employees and others who come in close contact with cattle and meat products. The melitensis strains are generally more infectious for man than other abortus varieties and the porcine strains more so than most bovine types. Laboratory infections among

those working with the bovine strains are almost unknown. Among workers with the melitensis group it is quite common.

Undulant fever is a disease of adult life, by far the greatest number of cases occurring between twenty and forty-five years of age. The figures presented show how rarely the disease has been found in the human being under adolescent age and particularly in infancy. The question might well be asked, "Have we been overlooking it in these young individuals or may it perhaps manifest itself in mild atypical forms in infancy and childhood?"

TABLE I

SHOWING SOURCE OF INFECTION BY AGE GROUPS IN 1,647 CASES OF B. ABORTUS INFECTION (KRISTENSEN)

AGE	CONTACT		MILK		INDEFINITE INFORMATION		NO INFORMATION		TOTAL	
	M	F	M	F	M	F	M	F	M	F
0- 4	–	2	1	–	–	1	–	–	1	3
5- 9	5	–	8	8	2	3	1	–	16	11
10-14	24	8	15	14	5	3	3	–	47	25
15-19	109	20	31	10	20	6	12	2	172	38
20-24	108	10	28	15	34	4	6	2	176	31
25-29	135	13	44	15	34	10	4	1	217	39
30-34	113	15	47	20	23	8	7	2	190	45
35-39	69	10	29	17	15	3	3	1	110	31
40-44	59	7	30	15	19	6	5	3	113	31
45-49	43	9	30	3	8	12	4	2	85	26
50-54	24	8	15	10	9	1	4	3	52	22
55-59	14	4	15	8	8	1	3	1	40	14
60-64	13	5	3	5	2	5	2	1	20	16
65-69	4	1	1	4	2	–	–	–	7	5
70-	1	–	1	2	–	2	–	–	2	4
Unknown	27	2	9	2	4	1	4	3	44	8
Total	748	114	307	148	185	66	58	21	1,298	349
	862		455		251		79		1,647	

Larson and Sedgwick in 1913 examined the sera of 425 institutional children and found 17 per cent positive, employing both the agglutination and complement-fixation tests. Guest[27] applied the abortus agglutination test to 250 sera obtained at the Children's Hospital of Boston and found only one positive reaction through a dilution of 1:40. Friedrich Wolter[28] quotes Madsen as stating that in a large children's hospital in Copenhagen in a region where a great deal of raw milk is consumed and abortus infection is prevalent, he was unable to obtain one positive serologic reaction for Bang's disease in children under ten years of age. Fleischner and Meyer[29] examined the sera of 200 children, all with negative results.

After we had seen 5 infections in young children in our district we performed the agglutination test for B. abortus on the sera of 1,000 children ranging in age from infancy to ten years. These sera were

obtained in a manner to represent a fair cross-section of the population. The majority of these children were not ill. We were able to obtain only one positive reaction and that in a boy ten years of age who gave a history of two years' residence on a farm in Kansas. He had consumed large quantities of raw milk from a single small herd and also came in close contact with the cattle.

It would seem that if children acquired an immunity through the ingestion of milk that we should be able to get more definite serologic evidence of this fact. The infant and young child, the greatest consumers of milk, show the lowest human incidence to the disease. The nature of this resistance is not definitely understood.

Veterinarians for many years have known that calves show a relative immunity. Hayes[30] remarks: "Calves do not become permanently diseased even though they are exposed to heavy doses of the germs during their milk drinking period. However, there is no immunity conferred to such calves and if they are exposed to the infection at breeding age they prove highly susceptible." Serologic tests carried on by one of our dairy companies on calves in an unprotected herd showed only 7 per cent of reactors at six months of age.

May there not be some analogy between the young child and the calf before breeding age?

We shall not go into a detailed description of our five cases (Table II) but will tabulate them and confine ourselves to giving the data which we feel is of interest or of importance. Unfortunately blood cultures were not taken. It will be noted that all of these cases occurred during a period of ten months. We have not been able to discover a case since that time. These children all consumed more or less raw milk and as far as we could determine contact infection was excluded. Does this mean that at that particular time we were dealing with some unusually virulent bovine strain of B. abortus or were these children perhaps receiving repeated massive doses of an organism? We cannot answer this question. The complaint of feeling tired and weak was present in all children over one year of age. Sweats, where they occurred, were drenching in character and generally came on at night or when the child was asleep. Flushing of the face and a sense of heat were usually complained of in the afternoon. The health of these children since recovery has been good. It is of interest that now, three years after the onset, agglutination tests in all of the children are negative, the complement-fixation test, however, being positive in one instance. The spleen, when enlarged, felt rather firm. Tenderness was not particularly in evidence. The hyperesthesia observed in one instance was quite extreme, almost such as one sees in a beginning case of poliomyelitis.

TABLE II

CASE REPORTS

AGE	YEAR ONSET	COMPLAINT	SPLEEN	LEUCOCYTES	SKIN	AGGLUTINATION		COMMENT	COMPLEMENT FIXATION	DURATION
						1929	1932			
12 mo. M.	4/29	Loose stools Temperature Pallor	Palpable 4½ mo.	5,427 Monos 73%	Erythema of face and trunk	1:2560	Neg.	Protracted diarrhea Sweating	Neg.	7½ mo.
3 yr. M.	3/29	Weakness Pallor Anorexia Temperature Nervousness	Palpable 10 mo.	3,657 Monos 60%	Erythema of face and trunk	1:2560 1:740	Neg.	Hyper-esthesia Sweating 6 relapses	Neg.	11 mo.
3 yr. M.	12/28	Throat infection Temperature Weakness	?	7,900 Monos 60%	Icteric hue	1:160	Neg.	Sweating	Pos.	10 mo.
9 yr. M.	4/29	Weakness Temperature	Palpable 2 mo.	4,134 Monos 44%	No	1:680 1:320	Neg.	Stomatitis	Neg.	Febrile for 12 days No relapses
12 yr. F.	10/29	Weakness Temperature	Not palpable	7,950 Monos 48%	No	1:640	Neg.	Sweating	Neg.	2 mo.

The clinical study of cases of undulant fever has until now been confined to the more severe types. The case of the boy, nine years of age, is of particular interest as his febrile reaction continued for only twelve days and there was no relapse. The occurrence of this very mild case suggests that infections of this type may be more frequent than we generally assume. This type exists and has been quite frequently observed among adults suffering from melitensis infections on the isle of Malta. This child was back in school in one month and the parents report no illness since that time. Unexplained febrile attacks, even when not protracted and particularly if accompanied by splenic enlargement, should cause us to consider the possibility of B. abortus infection.

The apparent low incidence of the disease in infancy and early childhood allows us to state that undulant fever, at present, does not constitute a major health problem in early childhood. B. abortus infections are principally a veterinary and occupational problem in the live stock industry and consequently also an economic problem. We should make every effort to eradicate the infection from our herds of milk cows, goat herds and pig raising establishments, or demand adequate pasteurization of milk when the disease cannot be otherwise controlled. In this effort the dairyman should be very willing to cooperate if for no other reason than that by the elimination of the infection he will be rewarded by about a 20 per cent increase in the milk productivity of his cows and in a decided increase in the number of healthy calves born.

The entire subject of undulant fever is still in a state of discussion (Theo. Smith[31]). Definite answers to many pertinent questions regarding the subject must be deferred at this time. The question: "Why do infants and young children rarely develop clinical undulant fever infection?" is most frequently submitted. An answer, based upon data and observations recorded in this literature and only in part given in this paper, suggests itself. It has been fully established that the incidence in infancy and early childhood is remarkably low. Likewise we believe that a statement that the infant and young child are the greatest consumers of milk, is not open to controversy. If milk is the main source of infection, then we have here a paradoxical situation. The tentative explanation we wish to propose follows:

1. Lack of contact with infected animals.

2. (a) Low pathogenicity of the bovine variety of B. abortus for man, especially when ingested. (b) Generally small number of organisms ingested.

3. Biological immaturity of the tissues of the young child. In support of the first point it is evident that infants and young children

rarely come in intimate contact with cows, swine or goats. Infection by contact is statistically most frequent and experimentally (infection through the abraded or unabraded skin) more easily accomplished with few organisms than by ingestion of the organism.

Most bovine strains of B. abortus are far less virulent for monkeys, and, in the few experiments cited, for man than either the porcine or melitensis varieties. The probable medium of infection in children—milk—generally contains only this least harmful variety of B. abortus. It is difficult to infect the monkey or man by way of the gastrointestinal tract with the ordinary bovine strain even when massive doses are employed. In commercial milk as normally produced, the bacterial concentration is always diluted by the admixture of milk from healthy or noneliminating cows in the herd. The dosage therefore is not a massive one as a rule. This information we feel supports our second point.

To maintain our third point we must resort to speculation. Heifers show a decided nonsusceptibility until they reach the breeding age. In man the disease very definitely predominates between the ages of 16 and 45. May it not be possible that the human organism requires some biologic changes in some of its tissues (chorion epithelium, certain cells in sex glands) such as might be associated with the occurrence of adolescence, before it becomes a suitable media for the growth of at least the mildly pathogenic bovine strain of B. abortus?

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THE PARANASAL SINUSES IN SCARLET FEVER*

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IN CLINICAL epidemiology it appears to be true that the epidemiologic chain is no stronger than its weakest clinical link. The rôle of the paranasal sinuses is very important in the epidemiologic chain of scarlet fever, but the usual concept of the sinuses in scarlet fever forms a very weak clinical link. The fact is that sinusitis in childhood is not a clear-cut clinical entity, and when it occurs in connection with scarlet fever, it may be even less characteristic.

In the last ten years Dean[1] has often called attention to the importance of sinus disease in infancy and childhood. Very little has appeared to emphasize the significance of the sinuses in scarlet fever. Gustav Killian,[2] it is true, published his classical paper on sinusitis in scarlet fever back in 1908, but that dealt primarily with the suppurative type of case, requiring radical treatment. A very recent study is that of Bäumler[3] who reported on sinus disease in 100 cases of scarlet fever in children.

Gordon[4] in a recent study of infecting cases in scarlet fever brings out the fact that scarlatinal patients with rhinitis and sinusitis have a higher infecting case rate than any other group with a single complication. The clinical and epidemiologic aspects of this problem thus tie up closely with the question as to when a scarlet fever patient may be released without the likelihood of infecting others. In New York State the sanitary code provides a minimum isolation period of thirty days, and until all discharges from the nose, throat, ears and suppurating glands have ceased, but not to exceed ninety days. In complications like suppurating lymph nodes or purulent otitis media, the cessation of discharge is readily obvious. The condition of the throat can be easily determined by inspection. The ordinary inspection of the nose, however, fails to yield the desired information on the condition of the nasal passages and accessory sinuses, and bacteriologic control by nasal cultures for hemolytic streptococci does not appear adequate in Gordon's large experience and our own more limited series. It occurred to us that a roentgenologic study of the sinuses might help to throw some light on the subject.

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TABLE I

NUMBER AND PER CENT DISTRIBUTION OF SCARLET FEVER CASES AND THOSE HAVING SINUSES X-RAYED, ACCORDING TO AGE GROUPS

	TOTAL		UNDER 5		5 TO 9		10 TO 14		15 TO 19		20 AND OVER	
	NUMBER	PER CENT	NUMBER	PER CENT	NUMBER	PER CENT	NUMBER	PER CENT	NUMBER	PER CENT	NUMBER	PER CENT
Cases in city	1,205	100.0	186	15.4	544	45.1	236	19.6	79	6.6	160	13.3
Cases x-rayed	292	100.0	28	9.6	134	45.8	59	20.2	18	6.1	53	18.3

TABLE III

NUMBER AND PER CENT DISTRIBUTION OF SCARLET FEVER CASES AND THOSE HAVING SINUSES X-RAYED, ACCORDING TO TIME OF YEAR (BIMENSUAL)*

	TOTAL		FEB. AND MAR.		APR. AND MAY		JUNE AND JULY		AUG. AND SEPT.		OCT. AND NOV.		DEC. AND JAN.	
	NUMBER	PER CENT	NUMBER	PER CENT	NUMBER	PER CENT	NUMBER	PER CENT	NUMBER	PER CENT	NUMBER	PER CENT	NUMBER	PER CENT
Cases in city	1,205	100.0	441	36.6	420	34.9	130	10.8	46	3.8	47	3.9	121	10.0
Cases x-rayed	292	100.0	68	23.3	111	38.0	42	14.4	7	2.4	12	4.1	52	17.8

*Bimensual periods were chosen having more nearly similar weather conditions.

PURPOSE, SCOPE AND METHOD OF INVESTIGATION

This work began early last year with x-ray examination of the accessory sinuses of children with scarlet fever, who developed otitis media and mastoiditis, and of those whose stay in the hospital had to be prolonged by reason of nasal discharge and protracted, though slight fever. It soon became desirable to know the incidence of sinus involvement in scarlet fever by age, season, etc., and routine examinations were begun. At first the clinical study led to ordering x-ray films and later the x-ray reports led to more careful clinical examination. Drs. Linus S. Cave and Gordon D. Hoople of the nose and throat service at the City Hospital cooperated. Dr. Donald S. Childs, professor of clinical radiology at Syracuse University, directed the x-ray work and personally read all the films. The clinical work on pediatric cases and the official confirmation of scarlet fever diagnosis and release of all hospital patients devolved upon the writer and only occasionally upon his associates in the health department or the pediatric service.* Adult patients were soon included for comparison through the cooperation of the medical service.

Films with double screens were used at 25 inches, with a 3½-inch gap and 20 milliamperes. Lateral and Law and Waters P-A views were taken to visualize the maxillary, ethmoid and frontal sinuses. As in Bĕumler's study, the sphenoids were left out.

It was thought that by correlating the x-ray, clinical and epidemiologic aspects, more definite knowledge might be gained about the incidence of sinus involvement in scarlet fever, its relation to some of the septic complications and to the duration of infectivity. Included in the plan was the study of a control group of cases, but this series is as yet too small for comparison.

TABULATION AND ANALYSIS OF THE RESULTS

This study was carried out in the City Hospital of Syracuse from February, 1930, to the end of August, 1931. This preliminary report deals with 292 cases, about one-fourth in 1930 and the remainder in 1931. This number comprises about 25 per cent of the total cases in the city. The percentile age distribution is shown in Table I. It is seen that they run fairly parallel except in the adult and preschool groups. The latter has comprised entirely the three- and four-year-olds, since before that age it is almost impossible to get cooperation. From Table II it is seen that the sex distribution is practically identical in the two groups.

*Drs. G. D. Mahar, J. R. Wilson and H. H. Volan.

TABLE II

SEX DISTRIBUTION OF SCARLET FEVER CASES AND OF THOSE HAVING SINUSES X-RAYED

	TOTAL	MALE	FEMALE	RATIO
Cases in city	1,205	579	626	1:1.081
Cases x-rayed	292	140	152	1:1.085

Table III gives the percentile distribution in the two groups according to the time of the year, arranged for convenience in bimensual periods.

In order to analyze the sinus x-ray reports objectively, they were classified by a descriptive word rather than by diagnosis: the terms clear, hazy, dense and opaque were used. In the first group were placed those in which all the observed sinuses were negative or clear. When one or more sinuses were found hazy they were put in the second group. One or more sinuses showing respectively density or opacity, regardless of the condition of the remaining sinuses determined the other groupings. The roentgenologist is not responsible for this arbitrary classification or grouping and was not aware that it was to be used.

TABLE IV

NUMBER AND PER CENT DISTRIBUTION OF SCARLET FEVER CASES HAVING SINUSES X-RAYED, ACCORDING TO TYPE (DESIGNATION OF SHADOW)

TOTAL		CLEAR		HAZY		DENSE		OPAQUE	
NUMBER	PER CENT	NUMBER	PER CENT	NUMBER	PER CENT	NUMBER	PER CENT	NUMBER	PER CENT
292	100.0	26	8.9	201	68.8	44	15.1	21	7.2

Table IV shows the number and percentage of cases in each x-ray classification. The rarity of negative films was rather unexpected, particularly since it has always been felt that a clear picture is a most reliable negative finding. In Table V the time since onset when the film was taken is brought out and it is seen that 70 per cent were taken in the first two weeks. It has been found, however, that the percentage distribution of the different types was not materially al-

TABLE V

NUMBER AND PER CENT DISTRIBUTION OF SCARLET FEVER CASES HAVING SINUSES X-RAYED, ACCORDING TO WEEK AFTER ONSET

TOTAL		FIRST WEEK		SECOND WEEK		THIRD WEEK		FOURTH WEEK		FIFTH WEEK AND LATER	
NUMBER	PER CENT	NUMBER	PER CENT	NUMBER	PER CENT	NUMBER	PER CENT	NUMBER	PER CENT	NUMBER	PER CENT
292	100.0	117	40.0	89	30.5	37	12.7	37	12.7	12	4.1

tered in this series, whether the film was taken in the first week of the disease or the fourth. Further evidence in support of this finding is obtained from a group of 16 cases that had routine films taken shortly after admission and another set in ten to twenty-nine days, but in most instances after an interval of three weeks. Five showed improvement, but 11 were unchanged in appearance. Bäumler says that in his 80 cases that were negative at first no pathology of the sinuses was found later.

In Tables VI, VII, and VIII the cases are arranged according to type of sinus, by age groups, length of isolation period and type of disease respectively. If one may venture to draw some inference cautiously, the cases having clear sinuses would probably be least in controversy. From Table VI it appears that no clear sinuses were

TABLE VI

CASES OF SCARLET FEVER HAVING SINUSES X-RAYED, ACCORDING TO THE TYPE OF SINUS (DESIGNATION OF SHADOW), BY AGE GROUPS

	TOTAL	CLEAR	HAZY	DENSE	OPAQUE
All ages	292	26	201	44	21
Under 5	28	–	19	5	4
5 to 9	134	12	85	24	13
10 to 14	59	5	46	7	1
15 to 19	18	2	15	1	–
20 and over	53	7	36	7	3

found in the three- and four-year-olds, and 8 to 9 per cent in children five to fourteen; but in the older children and adults the percentage of clear sinuses rises to 11 to 13. Bäumler concludes also that the younger the child the greater the likelihood that the sinuses will be pathologically involved in scarlet fever. The effect of season is indicated in that up to April, 1931, only 8 clear sets were found in 150 cases or 5 per cent; while among the 133 additional cases April 1 to the end of August, 18 more were reported clear, raising the percentage

TABLE VII

CASES OF SCARLET FEVER HAVING SINUSES X-RAYED ACCORDING TO THE TYPE OF SINUS (DESIGNATION OF SHADOW), BY LENGTH OF ISOLATION PERIOD

ISOLATION PERIOD (DAYS)	TOTAL	CLEAR	HAZY	DENSE	OPAQUE
Total	292	26	201	44	21
30	72	9	53	6	4
31 to 35	105	9	71	17	8
36 to 40	35	2	26	4	3
41 to 50	33	3	26	4	–
51 to 60	16	1	11	2	2
61 and over	9	–	5	3	1
Uncertain*	22	2	9	8	3

*Includes cases that left the hospital to continue isolation in homes outside the city and cases whose isolation was prolonged for reasons not directly connected with condition of sinuses.

to 13.5. Similarly the cases with clear sinuses have the highest percentage (nearly 25) getting out in the minimum isolation time (Table VII). Moreover, they form the highest percentage (11) of the mild cases as against 6 of the moderate and 1.7 of the severe type of scarlet fever;

TABLE VIII

CASES OF SCARLET FEVER HAVING SINUSES X-RAYED, ACCORDING TO THE TYPE OF SINUS (DESIGNATION OF SHADOW), BY TYPE OF DISEASE

TYPE OF DISEASE	TOTAL	CLEAR	HAZY	DENSE	OPAQUE
Total	292	26	201	44	21
Mild	162	18	98	17	10
Moderate	91	7	63	15	6
Severe	58	1	40	12	5

or to put it in another way, 70 per cent of cases having clear sinuses are found in the mild disease type (Table VIII).

It will hardly do, however, to base the argument on cases having clear sinuses when they constitute but 9 per cent of the entire series. One might be willing to concede significance to those showing dense or opaque shadows in their sinuses but these two groups together make up only 22 per cent of the series. Evidently it is the large group of cases with hazy sinuses, making up about 69 per cent of all our cases that must bear the brunt of the argument.

The writer is neither competent nor willing to enter into a discussion of the difficult field of x-ray interpretation, but even for a statistical discussion of these results some mention must be made of the criteria in this work. In a personal communication, Dr. S. Fineman of New York points out that a satisfactory film of the sinuses must, first of all, show the maximum contrast between the shadows cast by the bones and those cast by the air cavities, and it is particularly difficult to obtain these contrasting shadows in children because their bones are relatively thin and soft and the air cavities and cells are small. Second, except in the lateral view, the head must be maintained in such a position that the sagittal plane is nearly as possible at right angles to the film. Deviation of the head to either side may cause the projection of misleading shadows, and rotation of the head, if present, must be noted and due allowance made in the interpretation. In addition, Fineman[5] maintains that stereoscopic views are most desirable and that in the vast majority of cases "flat" films are inadequate for a reliable diagnosis. These and other roentgenologic aspects of the problem will be taken up by Dr. Childs in a subsequent report. The question of particular sinuses involved is not considered in this report either. In agreement with earlier studies, the maxillary sinuses were most commonly involved and the ethmoid cells came next; the frontals were in many instances found undeveloped in children.

The significance of the various types of abnormal shadows in sinus x-rays must, in the last analysis, be considered from the standpoint of the clinical aspects of the case. Clinically it is most essential to differentiate between asymptomatic thickening of membrane and the presence of pus in a sinus. It seems likely that a pathologic accessory sinus may give rise to but few symptoms locally and yet serve as a focus of infection.

Attempts to correlate the amount and kind of nasal discharge with the condition of the sinus as shown in the x-ray films were not successful. Mucopurulent discharge was found with each kind of abnormal sinus shadow. A small amount of thin discharge was present in some reported as having clear sinuses, while absent from some that showed dense or opaque shadows. The nasal mucous membrane was reddened in the vast majority of cases even at the time of release from isolation. At times the mucous membrane of the anterior part of the nose appeared thickened or swollen, even when no discharge was present and in these the x-ray report commonly showed hazy to dense shadows. Dean speaks of either discharge or stoppage as being associated with sinusitis. This summer (1931) a number of children suspected of having poliomyelitis because they complained of fever and headache, showed nothing on examination except reddening and thickening of the nasal mucosa with stoppage of secretion. They were thought instead to be suffering from sinusitis, particularly since there was a history of considerable swimming.

In endeavoring to correlate the x-ray shadows with clinical findings, a group of scarlet fever cases in this series that developed ear complications might well be singled out. Table IX gives the relation between the x-ray findings and the ear conditions. It should be noted that every one of the 33 cases of ear trouble shows abnormal shadows in the x-ray; conversely, no case with clear sinuses had any ear complications. Of the 33 cases, 26 had abnormal shadows bilaterally. The 7 cases that had x-ray evidence of sinus involvement on one side had the ear complications on the same side. The chief point in this connection is that 20 of these 33 cases were reported as showing only haziness and these included half of the cases showing mastoiditis. Here haziness in the x-ray assumes a greater significance than might be indicated from its frequency as reported in the series.

Exploration of the sinuses would be of unquestioned value in diagnosis. This was done in only one instance and the results diverged widely from the x-ray interpretation. The sinuses of a seven-year-old boy were x-rayed five days after the onset of scarlet fever and the left antrum was reported dense. This was a very mild case, the temperature becoming normal on the fifth day. On the twenty-ninth day

TABLE IX

TYPE OF SINUS (DESIGNATION OF SHADOW) AND SIDE OF BODY INVOLVED IN CASES OF SCARLET FEVER COMPLICATED BY OTITIS MEDIA AND MASTOIDITIS; RELATION OF TYPE AND LOCATION OF SINUS TO LOCATION OF OTITIS MEDIA AND MASTOIDITIS

		TYPE OF SINUS AND SIDE AFFECTED														
		ALL TYPES			CLEAR			HAZY			DENSE			OPAQUE		
		SIDE AFFECTED			SIDE AFFECTED			SIDE AFFECTED			SIDE AFFECTED			SIDE AFFECTED		
		BOTH	RIGHT	LEFT	BOTH	RIGHT	LEFT	BOTH	RIGHT	LEFT	BOTH	RIGHT	LEFT	BOTH	RIGHT	LEFT
Ear affection	Number of cases	26	7	–	None			15	5	–	6	2	–	5	–	–
Otitis media	33	14	16	3	According to type and side of sinus affected (above)											
		Side affected			Both			9	–	–	1	–	–	4	–	–
					Right			5	5	–	3	2	–	1	–	–
					Left			1	–	–	2	–	–	–	–	–
Mastoiditis	18	2	10	6	According to type and side of sinus affected (above)											
		Side affected			Both			1	–	–	–	–	–	1	–	–
					Right			3	1	–	2	2	–	2	–	–
					Left			4	–	–	1	–	–	1	–	–

the nose culture was negative for hemolytic streptococci. There was slight reddening of the nasal mucosa, but no discharge. Two days later the x-ray was repeated and the left maxillary sinus found still dense. An antral window was made but no pus obtained.

This series might further be approached from the angle of infecting cases, which Gordon has found so revealing. Four such instances were found:

1. An eight-year-old boy. Onset of scarlet fever Nov. 20, 1930. The sinus x-ray on the twenty-seventh day showed the right maxillary sinus ha.., the left dense, the ethmoids clear and the frontals undeveloped. Illness very mild. On the day of the x-ray the nasal mucous membrane was slightly injected but there was no discharge. Cultures negative on the twenty-seventh and twenty-eighth days. Released thirty-first day. Six days later his nine-year-old brother came down with scarlet fever.

2. A nine-year-old boy. Onset March 18, 1930; developed left otitis media two days later. X-ray on the twenty-ninth day showed density of the maxillaries on both sides, other sinuses clear. Cultures negative on the twenty-eighth day; no discharge from ear or nose. Allowed to go at the end of thirty days. His four-year-old brother came down thirteen days later.

3 and 4. An eight-year-old girl. Onset Feb. 14, 1931; eight days later paracentesis of the right ear was done. On the tenth day the maxillary sinuses reported hazed bilaterally, other sinuses clear. Moderate case. Cultures negative on twenty-ninth day, but not released until the fortieth. Ten days later brother, aged eleven, and sister, aged six, came down with scarlet fever. The latter, whose onset was April 7, 1931, showed nine days later, haziness of both maxillaries and left ethmoid. Moderate case. No ear complications and very little nasal discharge after second week. Developed nephritis third week and remained in hospital until forty-ninth day, when taken home against advice. Eleven days later another sister developed scarlet fever.

In addition there was a three-year-old boy, not included in this series, who did not have sinus x-rays because of lack of cooperation. He had a very mild case. Cultures negative on the thirty-fourth day; released on the thirty-sixth. There was no nasal discharge. His six-year-old sister came down five days later.

There is no positive way of connecting these infecting cases with the sinus condition as shown in the x-ray, but the latter must at least be considered, inasmuch as inspection and cultures failed to pick them out. Incidentally even if the infecting case that was not x-rayed be included, the infecting case rate is only 1.7 per cent.

DISCUSSION

That paranasal sinus infection occurs frequently in scarlet fever is emphasized by all writers on accessory sinus disease and on scarlet fever. The incidence of such involvement has not been definitely established. Bäumler in his study of 100 consecutive scarlet fever cases in Cologne, considered that in 20, sinus infection was established on clinical and roentgenologic grounds.

Whether the sinus mucosa is concomitantly affected with the nasal mucosa in an attack of acute coryza or whether the inflammation follows secondarily is, in Skillern's opinion[6] a moot question. There are those who believe that even in rhinitis or coryza there is really a rhinosinusitis.[7] Skillern is inclined to this view but suggests that the sinus mucosa need not necessarily be affected to the same degree as the nasal chambers. Few have definitely believed this to be the case in scarlet fever. Hubbard[8] probably expresses the usual view in saying, "We should treat the acute rhinitis of scarlet fever as a definite infection of the nasal mucosa, liable at any time to invade the sinuses." Killian, nearly twenty-five years ago, with remarkable clinical acumen, emphasized that even in simple coryza the nasal sinuses are not infrequently involved and that particularly in the forms of coryza incident to scarlet fever, sinusitis is most to be suspected.

The clinical diagnosis of sinusitis is not easy, especially in children, and most particularly in children with scarlet fever, with the exception of the few cases (about 1 in 100-150) that show lid swelling. The clinical picture is not characteristic in the vast majority; symptoms may be absent or obscured by toxemia or sepsis; rhinoscopic examination of the sick child cannot be carried out adequately and transillumination is often unsatisfactory. Dean points out that in acute sinus involvement there may be nasal stoppage rather than discharge, and Killian showed that in scarlet fever, pyemia and meningitis may occur in consequence of purulent sinusitis without local or external evidence to point to the affection of the sinuses. In Bäumler's 20 clinically positive cases only 12 showed nasal discharge.

The roentgen diagnosis of sinus involvement, despite its many shortcomings, must, therefore, take a very important place. Without assuming that all of the cases showing x-ray shadows necessarily had sinus infections, it must appear significant, nevertheless, that 91 per cent were not clear. We do not have a control group of the same age and seasonal distribution without scarlet fever. In at least one instance in this series a child had had several attacks of otitis media and had been operated upon for left mastoiditis some three years before an attack of scarlet fever at the age of six. She developed bilateral otitis media at the onset of scarlet fever. X-ray showed bilateral hazing, more marked on the right, and it later became necessary to operate on the right mastoid. Obviously the oto-rhinological history must have its effect. It would also be necessary to have similar studies of scarlet fever and control groups in other places so as to evaluate if possible the climatic factor. While it is unsafe to draw far-fetched conclusions on the basis of this partial and preliminary work, the question arises whether in scarlet fever sinus involvement

is not the rule rather than a complication, and whether in this involvement we do not have a larger and more potent clinical and epidemiologic factor than has been realized.

SUMMARY AND CONCLUSIONS

1. About 300 out of 1200 cases of scarlet fever have been studied during the past nineteen months in all of whom roentgen examination of the sinuses was made.

2. In this series, 91 per cent showed shadows designated as hazy to opaque, and only 9 per cent were reported clear.

3. The sinus conditions as shown by x-ray were related to age, season, time since onset, length of isolation period, types of disease and other clinical and epidemiologic aspects.

4. Without desiring to draw unwarranted conclusions in the absence of control studies, the question is raised whether sinus involvement in scarlet fever is not the rule rather than a complication.

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THE EFFECT OF VITAMIN D IN INCREASING RESISTANCE TO INFECTION*

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IT IS well recognized clinically that rachitic infants are especially prone to develop respiratory infections, but it is often presumed that these have a local origin; i.e., that they are due to the marked deformity of the chest, and that the general resistance of the child is not decreased. Very few investigations have been undertaken to discover whether the resistance of rachitic animals is any lower than that of controls which were given vitamin D in addition to the diet. Eichholz and Kreitmair[1] found that adult rats on a rickets-producing diet, which was, of course, devoid of vitamin D, died in much larger numbers from a natural epidemic than others on the same diet which received this vitamin. They considered that this demonstrated that animals lacking vitamin D were less resistant to spontaneous infection. They obtained the same results when they tested the ability of adult mice, on the same diets, to survive intraperitoneal injections of pneumococci. Maurer and Hofmann[2] also found a decreased resistance, as a much smaller dose (intraperitoneal) of suipestifer bacilli (''pig typhoid'') would kill a young rachitic rat lacking vitamin D than one which was given some of this vitamin daily. Further confirmation of the theory was supplied by Grant[3] who showed that the addition of vitamin D increased the resistance of rachitic rats to tuberculosis. Rachitic rats also show increased resistance when the vitamin D is provided indirectly by the irradiation of the animal. In one series (Robertson[4]), the rats were exposed to direct sunshine and were infected with colon bacilli, and in the other (Blackberg[5]) a carbon arc lamp was used and tetanus toxin was injected. In contrast to these reports, Boynton and Bradford[6] recently failed to show any reduction in resistance from a deficiency of vitamin D. The test of resistance was the survival of the rats after an intraperitoneal injection of a respiratory organism, and the diagnosis of rickets was made on the gross pathologic findings.

In a previous investigation[7] the authors showed that the addition of vitamin D (as irradiated whole wheat) to McCollum's rickets-producing diet markedly raised the resistance of rachitic rats to an oral ''rat typhoid'' infection. McCollum's diet is low in vitamin A, but as both the rats with and without the vitamin D received the same amount of vitamin A, this does not vitiate the results.

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In the following experiments all the vitamins except D were supplied in considerable amounts. Litters of albino rats (which had just been weaned) were divided into four groups. Two of these (Groups 1 and 2) were put on Steenbock's rickets-producing diet,[8] which was modified by the addition of 6 per cent wheat germ, and 1 per cent alfalfa, and by the substitution of 12.5 per cent of dried ordinary white bread for 12.5 per cent of the yellow corn. In addition each rat received 2 c.c. of strained tomato juice every other day. This diet pro-

Fig. 1.

Fig. 2.

Fig. 1.—Roentgenogram of leg of rat kept inside on rachitogenic diet. Note marked rickets.

Fig. 2.—Roentgenogram of leg of rat kept inside and fed the same rachitogenic diet with the addition of vitamin D. Note absence of rickets.

vides considerable amounts of vitamins A, B, C and E. The other groups (Groups 3 and 4) were put on a diet which was identical in every respect, except for the fact that 12.5 per cent of dried vitamin D bread[9] instead of ordinary bread was used. This provides in the final food mixture 3.5 Steenbock vitamin D units per 100 grams.

In order that these rats might serve as controls in another series of experiments, two different environments were provided. Group 1 (with-

out vitamin D) and Group 3 (with vitamin D) are strictly comparable, as they were both kept in the same animal room throughout. Group 2 (without vitamin D) and Group 4 (with vitamin D) are equally comparable, as they were put in the midday sun behind common window glass for two hours daily, and were exposed to fresh air at the same time. Groups 2 and 4 were benefited by this treatment; they both were more resistant to the disease,[10] but there was no evidence of any curing of the rickets in Group 2.

Forty rats were started in each of twenty experiments. After the animals had been on the diet for four weeks, two representative rats were killed from each group, and the degree of rickets was estimated

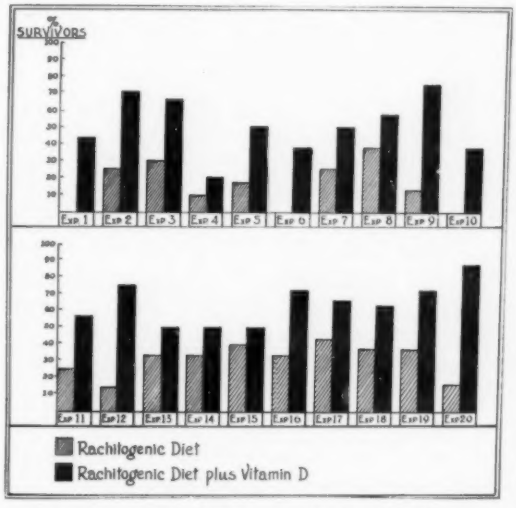

Fig. 3.—Percentage of survivors of infected rats fed the rachitogenic diet with and without the addition of vitamin D. None of the rats on the rachitogenic diet in Experiments 1, 6 and 10 survived.

by the inorganic blood phosphorus, the percentage of ash in the leg bones and by x-ray photographs (Figs. 1 and 2). In every case the rats on the diet without vitamin D showed marked rickets, and those on the diet with vitamin D showed no rickets. The remainder of the rats in each experiment were then starved overnight, put in individual cages and all fed the same small dose (usually $\frac{1}{100}$ c.c.) of an 18-hour culture of Salmonella muriotitis ("rat typhoid") on a small cube of dried bread. Precautions were taken to see that all the bread and crumbs were eaten, and also that the excreta from one cage could not contaminate another cage. This organism, a strain of S. enteritidis, which was originally isolated from a sick white rat, causes a natural disease in young rats. Death, which usually occurs in seven to ten

days, is preceded by marked diarrhea, cyanosis and a bloody discharge about the nostrils.

Blood cultures were taken aseptically from the hearts of all the dead rats, and the organism was regularly recovered, usually in pure culture. In other words, the rats had a muriotitis septicemia when they died. The rats were observed for 28 days after the infecting dose, when the experiments were terminated, and those which lived for this length of time constitute the survivors. The degree of resistance was estimated by the percentage of these survivors in each experiment. The results of the twenty experiments with rats lacking vitamin D (Group 1), and rats fed vitamin D (Group 3), which were all kept in the animal room, are shown in Fig. 3. In every case a much larger percentage of the rats which received the vitamin D survived. The total figures for all the experiments show that 33, or 22 per cent, of 147 rats fed the rachitogenic diet (Group 1) survived, as compared with 86, or 57 per cent, of 151 rats fed the same diet with the addition of vitamin D (Group 3). These rats were all kept in the animal room. Group 2, which lacked vitamin D but which received the benefit of the improved environment, showed 69, or 49 per cent, survivors of 139 animals, as compared with 87, or 73 per cent, of 119 animals fed the same diet plus vitamin D (Group 4), and kept under the same conditions. If the results from both series are included, it is seen that 35 per cent of 286 animals which lacked vitamin D survived in contrast to 64 per cent of 270 animals which received vitamin D. The results were analyzed statistically and the difference is a "real" difference, as there is less than one chance in several hundred that it is due to coincidence.

CONCLUSION

The addition of vitamin D, in the form of vitamin D bread, to a rachitogenic diet, which already contained considerable amounts of the other vitamins, raised the resistance of rats to a "rat typhoid" infection which was fed per os.

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THE EFFECTIVENESS OF METHENAMINE AS A URINARY ANTISEPTIC AT VARIOUS HYDROGEN-ION CONCENTRATIONS*

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IN THE treatment of urinary infections with methenamine a great variety of results has been reported. Many observers have reported failures. My early experience with use of the drug is possibly not unlike those of many of these observers. In a publication in 1918 on the treatment of pyelitis I stated that methenamine was of practically no value in the treatment of pyelitis. The way in which methenamine is used even at the present time invites failure. With better appreciation of the conditions necessary to insure efficient action, methenamine has proved, in my experience, the best urinary antiseptic at present in use.

Methenamine as such has no bactericidal power. Bacteria will multiply rapidly in culture medium containing methenamine in high concentration. The effectiveness of methenamine is dependent on the splitting off of formaldehyde in an acid medium. The amount of formaldehyde is dependent on the concentration of methenamine, the acidity of the medium, and the time for action. These important factors have not been sufficiently emphasized in the use of methenamine, particularly in relationship to the degree of acidity of the urine.

Often the urine of patients treated with methenamine is not even tested for its acidity, or it is tested with litmus which changes from blue to red at any P_H below 7.0. For the purpose, therefore, litmus is not a suitable indicator. A number of publications have called attention to the good results obtained when methenamine was used in conjunction with ammonium chloride. By use of this drug, it is possible in children to reduce the P_H of the urine to between 5.5 and 5.0 regularly and to hold it in that range for many days. Gradually increasing the dosage of methenamine it was often possible to kill off organisms in the urinary tract before the formaldehyde produced irritation of the bladder.

Johansen and Warburg, Beckman and Reis have shown that the acidity attainable in the urine on administration of ammonium chloride may in some cases be sufficient to free the urine of organisms. In cases in which this treatment by increasing acidity alone was not successful, addition of methenamine frequently cleared up the infection.

*From Section on Pediatrics, The Mayo Clinic.
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Johansen and Warburg reported sterilization at the end of eight hours at a P_H of 5.85, and a 1 per cent concentration of methenamine. At a P_H of 6.15 and 6.85 sterilization was not noted after eight hours, but it was obtained in twenty-four hours. Broth of a P_H of 7.15, containing 1 per cent methenamine incubated twenty-four hours at 37° C., developed sufficient bactericidal power to kill colon bacilli in four hours. This is contrary to the experience of others, who have been unable to show any antiseptic effect in an alkaline medium. The hydrogen-ion concentrations obtainable with ammonium chloride are very close to those at which acidity alone will act bacteriostatically, and the addition of a small amount of formaldehyde may have a more definite bactericidal effect at this P_H than at a higher one.

In the series of experiments to be reported, I have tried to determine the exact relationship of concentration of methenamine, P_H of the urine, and the time necessary for the development of bactericidal powers of the urine. I emphasize the element of time, because the methenamine is excreted as such into the urinary passages and only after it reaches the acid urine does it begin to split into formaldehyde and ammonia. While the urine remains in the urinary passages, sufficient bactericidal power must be developed to kill the organisms, or at least to prevent their growth if a therapeutic effect is to result.

METHOD AND RESULTS

Plain broth of P_H 7.1, or urine, was adjusted by means of tenth normal hydrochloric acid or tenth normal sodium hydroxide to the various values for P_H from 6.5 to 3.5. The P_H was determined by means of the electric potentiometer. A twenty-four-hour culture of colon bacilli in brain broth was used to seed the broth. Immediately after the broth or urine was inoculated, varying amounts of a 50 per cent solution of methenamine was added to 10 c.c. of broth or urine to give the desired concentration of methenamine. A series of tubes of broth or urine to which methenamine had not been added served as controls. After varying intervals of incubation at 37° C., material was removed from each tube by means of a capillary pipette, and four drops were added to tubes of liquid litmus lactose agar for plating. The colonies on the plates were counted after twenty-four hours, and the plates were examined again after forty-eight hours.

In corresponding respective tubes of each set of tubes in the first series of experiments, the broth was adjusted to a P_H of 5.5, 5.0, 4.5, 4.0 and 3.5. To one series of tubes 0.5 per cent of methenamine was added; the other series served as the acid controls. As will be seen from Table I there was growth in the control tubes at P_H 5.5, 5.0, and 4.5, from relatively small numbers of organisms, after two hours, to innumerable organisms at all three of these P_H values after twenty-

four hours. Definite inhibition of growth at P_H 4, and death of the organisms at P_H 3.5 resulted after four hours' exposure. In contrast to these figures the number of organisms at the end of two hours, as determined by the number of colonies on plates inoculated with the methenamine containing broth was low; at the end of four hours at P_H 3.5 and 4.0 the broth was sterile and all tubes were sterile at the end of six hours with the exception that there was one colony in the plate made of broth which had a P_H of 5.

TABLE I

EFFECT OF P_H ON BACTERICIDAL ACTION OF METHENAMINE IN BROTH

P_H	Without Methenamine	With 0.5 per cent Methenamine
Experiment 1		
Organisms After Two Hours		
5.5	5	5
5.0	21	2
4.5	50	3
4.0	8	3
3.5	13	1
Organisms After Four Hours		
5.5	968	6
5.0	776	3
4.5	520	4
4.0	200	0
3.5	0	0
Organisms After Six Hours		
5.5	Innumerable	0
5.0	3,680	1
4.5	1,760	0
4.0	4	0
3.5	0	0
Organisms After Twenty-Four Hours		
5.5	Innumerable	0
5.0	Innumerable	0
4.5	Innumerable	0
4.0	600	0
3.5	0	0
Experiment 2		
Organisms After Two Hours		
5.5	200	40
5.0	200	22
4.5	108	7
4.0	68	4
3.5	24	1
3.0	11	1
Organisms After Four Hours		
5.5	Innumerable	5
5.0	Innumerable	1
4.5	1,200	0
4.0	30	0
3.5	8	0
3.0	1	0

In experiment 2 (Table I) practically the same result was evident. There was a considerable number of organisms at the end of two hours in the control tubes, at P_H 5.5, 5.0 and 4.5, and marked inhibition at 4.0, 3.5 and 3.0, but no tubes were sterile at the end of four hours. In the tubes containing methenamine all were sterile at the end of four hours except the two with P_H 5.5 and 5.0, and the organisms in these had been reduced to 5 and 1, respectively.

In experiment 3 (Table II, control data in footnote only) inoculation was very much heavier, and the P_H range was 6.5, 6.0, 5.5, and 5.0. At the beginning of the experiment there were innumerable organisms on all plates made with four drops of the broth that was at the various values for P_H. No effect was seen after two or four hours; there were innumerable colonies on all plates. After five hours some reduction in the number of bacilli occurred, most marked in the broth which contained methenamine and which was of lowest P_H. After six hours this reduction in number was more marked. After twenty-four hours, all of the controls, as well as the urine containing methenamine, with a P_H of 6.5 and 6.0 still contained innumerable colonies on culture, whereas the specimens of broth of P_H 5.5 and 5.0 proved sterile on culture.

TABLE II (EXPERIMENT 3)

BACTERICIDAL EFFECT OF BROTH CONTAINING 0.5 PER CENT METHENAMINE*

P_H	Immediate	After Two Hours	After Four Hours	After Five Hours	After Six Hours	After Twenty-Four Hours
6.5	Innumerable	Innumerable	Innumerable	4,880	Innumerable	Innumerable
6.0	Innumerable	Innumerable	Innumerable	5,760	2,400	Innumerable
5.5	Innumerable	Innumerable	Innumerable	4,800	768	0
5.0	Innumerable	Innumerable	Innumerable	1,920	688	0

*All control plates contained innumerable colonies.

In experiment four (Table III) the set-up was the same as before, except that the concentration of methenamine in the broth was reduced to 0.25 per cent, 0.125 per cent, and 0.05 per cent. The inoculation in this series, too, was unusually heavy, and it is therefore impossible to determine bacteriostatic action. Plates inoculated from the control broth after two hours as well as from all of the broth containing methenamine after the same period contained innumerable colonies. After six hours there had been a definite reduction in the number of organisms in tubes with broth of P_H 4.5 and 5.0 and containing methenamine 0.25 per cent and 0.125 per cent, as well as with broth of P_H 4.5 and containing methenamine 0.05 per cent. After twenty-four hours, there were innumerable organisms in all the control tubes and in the tubes containing 0.05 per cent of methenamine. Only broth of P_H 4.5, containing methenamine 0.125 per cent was sterile and broth of P_H 4.5 containing methenamine 0.25 per cent con-

tained but three organisms. This can be compared with the result recorded in Table II; that is, tubes of broth of P_H 5.0 and 5.5 and containing the larger proportion of methenamine, 0.5 per cent were both sterile at the end of twenty-four hours.

TABLE III (EXPERIMENT 4)

EFFECT OF P_H AND OF CONCENTRATION OF METHENAMINE ON BACTERICIDAL ACTION OF BROTH

P_H	Percentage of Methenamine			
	0	0.25	0.125	0.05
Organisms at Beginning of Experiment				
6.0	Innumerable	Innumerable	Innumerable	Innumerable
5.5	Innumerable	Innumerable	Innumerable	Innumerable
5.0	Innumerable	Innumerable	Innumerable	Innumerable
4.5	Innumerable	Innumerable	Innumerable	Innumerable
Organisms After Two Hours				
6.0	Innumerable	Innumerable	Innumerable	Innumerable
5.5	Innumerable	Innumerable	Innumerable	Innumerable
5.0	Innumerable	Innumerable	Innumerable	Innumerable
4.5	Innumerable	Innumerable	Innumerable	Innumerable
Organisms After Five Hours				
6.0	Innumerable	Innumerable	Innumerable	Innumerable
5.5	Innumerable	Innumerable	Innumerable	Innumerable
5.0	Innumerable	Innumerable	4,800	Innumerable
4.5	Innumerable	3,200	2,560	3,200
Organisms After Six Hours				
6.0	Innumerable	Innumerable	Innumerable	Innumerable
5.5	Innumerable	3,600	Innumerable	Innumerable
5.0	Innumerable	960	2,400	Innumerable
4.5	Innumerable	1,600	1,120	1,200
Organisms After Twenty-Four Hours				
6.0	Innumerable	Innumerable	Innumerable	Innumerable
5.5	Innumerable	1,760	Innumerable	Innumerable
5.0	Innumerable	Innumerable	4,800	Innumerable
4.5	Innumerable	3	0	Innumerable

In place of broth, urine was used in experiments 5 and 6 (Tables IV and V). The urine in experiment 5 (Table IV) when passed, had a P_H of 5.0, and it was adjusted to P_H 5.5 and 6.1. As in the first four experiments, the concentration of methenamine was 0.5, 0.25, 0.125 and 0.05 per cent. Representing each P_H there was 40 c.c. of urine to which a definite amount of a twenty-four-hour broth culture of colon bacilli was added. To 10 c.c. portions of this urine the proper amount of a 50 per cent solution of methenamine was added to give the desired concentrations just mentioned. The tubes were incubated for two, four, six and twenty-four hours. The results were striking. As in the experiment in which a P_H of 6.0 was used there was practically no effect on bacterial growth with the two higher concentrations of methenamine. Although after six hours there apparently was some reduction in the number of bacteria in the highest concentration of meth-

enamine, after twenty-four hours the number was again innumerable. The two lower concentrations of methenamine were not used with the urine of P_H 6.1.

TABLE IV (EXPERIMENT 5)

EFFECT OF P_H AND CONCENTRATION OF METHENAMINE ON BACTERICIDAL ACTION OF URINE

P_H	Percentage of Methenamine			
	0.5	0.25	0.125	0.05
Organisms After Two Hours				
6.1	2,400	Innumerable		
5.5	440	920	1,088	3,800
5.0	656	1,040	720	960
Organisms After Four Hours				
6.1	Innumerable	Innumerable		
5.5	192	480	1,056	Innumerable
5.0	124	284	848	1,200
Organisms After Six Hours				
6.1	528	Innumerable		
5.5	0	300	680	Innumerable
5.0	0	0	43	824
Organisms After Twenty-Four Hours				
6.1	Innumerable	Innumerable		
5.5	0	0	1,600	Innumerable
5.0	0	0	0	0

After two and four hours (Table IV) the urine with a P_H of 5.5 showed a very definite trend. There was a larger number of colonies in the plates made from the specimens of urine to which the smaller amount of methenamine had been added. After four hours in the two higher concentrations, the colonies have been reduced from 440 to 192 and from 920 to 480, and after six hours the urine of P_H 5.5, and containing 0.5 per cent methenamine was sterile, and that containing 0.25 per cent allowed growth of only 300 colonies. After twenty-four hours at this P_H the urine containing both concentrations of methenamine was sterile. The bacteria in the urine of P_H 5.5 and containing 0.125 per cent methenamine remained practically unaffected; after two hours there were 1,088 colonies; after four hours, 1,056 colonies; after six hours a slight reduction to 680, and after twenty-four hours 2,600. Here only a bacteriostasis is evident but in the lowest concentration 0.05 per cent of methenamine there is definite growth at the end of all four periods when the P_H was 5.5.

At a P_H of 5.0 there was generally a definite effect with all concentrations of methenamine. After four hours, the organisms in the urine with the two higher concentrations were markedly reduced and after six hours all were dead. After six hours, the urine at P_H of 5.0 with 0.125 per cent methenamine contained only forty-three organisms on

culture and the urine with 0.05 per cent of methenamine, 824. After the twenty-four-hour period the urine was sterile in all concentrations of methenamine.

In the sixth experiment (Table V) the P_H ranged from 6 to 4.5 and the concentration of methenamine from 0.5 per cent to 0.05 per cent. Urine at various P_H values, without methenamine, was inoculated with colon bacilli the same as in the other experiments, and cultured after the same intervals. The number of organisms in each experiment was controlled immediately after inoculation in all experiments.

TABLE V (EXPERIMENT 6)

EFFECT OF P_H AND CONCENTRATION OF METHENAMINE ON BACTERICIDAL ACTION OF URINE

P_H	Percentage of Methenamine				
	0.5	0.25	0.125	0.05	0
Organisms at Beginning of Experiment					
6.0	3,520	8,000	4,800	3,200	
5.5	Innumerable	8,000	3,200	Innumerable	Innumerable
5.0	Innumerable	3,200	1,680	3,200	3,360
4.5	2,720	2,600	2,160	2,000	Innumerable
Organisms After Two Hours					
6.0	2,240	3,200	Innumerable	Innumerable	Innumerable
5.5	1,840	2,400	3,008	1,792	Innumerable
5.0	1,600	1,872	1,520	2,400	2,840
4.5	664	1,600	1,536	744	2,400
Organisms After Four Hours					
6.0	616	760	1,040	Innumerable	Innumerable
5.5	640	640	184	1,600	Innumerable
5.0	0	100	0	488	5,440
4.5	0	0	0	0	1,712
Organisms After Five Hours					
6.0	512	624	384	Innumerable	Innumerable
5.5	148	432	104	2,560	Innumerable
5.0	0	1	0	536	Innumerable
4.5	0	0	0	0	1,056
Organisms After Six Hours					
6.0	384	584	408	Innumerable	Innumerable
5.5	20	210	3	4,000	Innumerable
5.0	0	188	1	1,048	Innumerable
4.5	0	0	0	0	560
Organisms After Twenty-Four Hours					
6.0	Innumerable	Innumerable	0	Innumerable	Innumerable
5.5	0	0	0	Innumerable	Innumerable
5.0	0	0	0	480	1,280
4.5	0	0	0	0	27

The results were consistent throughout with one exception; the urine containing only 0.125 per cent of methenamine was sterile at all values for P_H at the end of twenty-four hours. It is the only experiment in which at a P_H of 6 there was a sterile urine at the end of twenty-four hours; this was in urine which contained 0.125 per cent methenamine. At the end of five and of six hours the reduction in the

number of bacteria was greater in the urine which contained 0.125 per cent methenamine than in that which contained 0.25 per cent of methenamine. The control urine, after twenty-four hours contained innumerable organisms at P_H of 6 and of 5.5; the numbers were definitely reduced at a P_H of 5.0 and markedly reduced at a P_H of 4.5 although not sterile. With all concentrations of methenamine except 0.125 per cent, at P_H 6.0 there was in general, gradual reduction in numbers down to the sixth hour, but after twenty-four hours innumerable organisms were again present on culture. At P_H 5.5 the reduction in the number of organisms was more rapid than at P_H 6.0 but no specimens were sterile at the end of six hours, although the number of colonies had been reduced to 20, 210, and 3 in the three higher concentrations of methenamine. After twenty-four hours, the three higher concentrations were sterile at P_H 5.5; the urine containing 0.05 per cent methenamine contained innumerable bacilli. At the end of four hours, at P_H 5.0 the urine containing the 0.5 per cent concentration of methenamine and that containing 0.125 per cent were sterile on culture. From the urine containing 0.25 per cent methenamine, and at a P_H of 5.0, only a single colony grew on culture at the end of five hours; 188 at the end of six hours, and none after twenty-four hours. At P_H 4.5 there was a marked reduction after two hours in the number of organisms at all concentrations of methenamine; after four hours they were all sterile, as they were after all other periods longer than four hours.

COMMENT

This series of experiments indicates in a very definite way the conditions under which it is possible to obtain bactericidal action in urine within a period not exceeding its stay in the urinary tract (four to eight hours.)

It is of importance to note (Table V) that the P_H of urine readily attainable on administration of ammonium chloride is not sufficient to kill the colon bacillus. Even at P_H 4.5 the urine in the control tubes still contained viable organisms after twenty-four hours' exposure at 37° C. In contrast, the urine of P_H 4.5 containing 0.05 per cent methenamine, was sterile at the end of four hours. With slightly larger concentration of methenamine 0.125 per cent the urine was sterile after four hours at a P_H of 5.0, but it was not sterile at P_H 5.5 even with 0.5 per cent methenamine after six hours. In all experiments with P_H 6.0 and all concentrations of methenamine with one exception there were innumerable organisms in the incubated urine after twenty-four hours.

As Johansen and Warburg have shown, the acidity of the urine after the administration of ammonium chloride may be sufficient to kill in-

fecting bacteria, or, by preventing their growth, may gradually allow washing the urinary tract free of infection. It is evident from my experiments in both broth and urine, that if the organisms are to be killed in an interval corresponding to the average stay of the urine in the urinary tract, the urine must have a P_H below 5.5, preferably as close to P_H 5.0 as possible. It is very unusual to find a urine of P_H 5.5 to 5.0, if the subject is on a general diet without the administration of some acid-producing drug. Thus, the first step in treatment with methenamine must be to render the urine acid to a P_H of 5.0, or at all events below 5.5. To ascertain such a degree of acidity, I found it convenient to employ methyl-red paper. This, when dry, has a yellowish color, which changes to deep red when placed in a solution at a P_H below 5.5. Until the urine turns the paper red, administration of methenamine cannot be expected to give results. After the proper dosage of ammonium chloride has been found to render the acidity of the urine below P_H 5.5, administration of methenamine is started in small amounts, and, as can be seen from the experiments, the results should be obtained in a relatively short period of time. If no effects are achieved in two days, the dose of methenamine can be increased, and after forty-eight hours another culture can be taken. If the infection persists, the dosage can be further increased, until either a sterile urine is obtained or evidence of irritation of the bladder sets in. It should be possible to tell within two weeks whether treatment with methenamine will be successful in any particular case.

SUMMARY

At a P_H of 6.0, urine with a 0.5 per cent concentration of methenamine rarely sterilizes itself at the end of twenty-four hours. At a P_H of 5.0 urine with a 0.5 per cent concentration of methenamine can be sterile after four hours at 37° C. Treatment with methenamine, without constant control of the P_H of the urine, is likely to be unsuccessful.

ANEURYSM OF EXTERNAL ILIAC ARTERY AND GANGRENE OF LEG AS COMPLICATIONS OF BACTERIAL ENDOCARDITIS*

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DURING the last few years several cases of gangrene occurring in children have been reported. Aneurysm in children, while comparatively rare, has also been reported, but I have been unable to find a case where both conditions have occurred in the same child. Aneurysms in children are generally of the aorta.

Bronson and Sutherland[1] have reviewed the literature and report a case of ruptured aortic aneurysm in a child and state that aneurysms in children may be classified according to their etiology.

1. Arteriosclerotic.
2. Traumatic.
3. Embolic or septic.
4. False, due to erosion from without.
5. Due to congenital anomalies.

They state that aneurysms may result from a septic embolus and that aneurysm may be associated with rheumatism.

Recently juvenile gangrene, having as its etiology acute infection, has been reported by different clinicians. Craig and Muns,[2] Irving Wright,[3] and Martin and Shore[4] have all made splendid contributions. Martin and Shore reported four cases, reviewed the literature and made a thorough study of the pathology. They state that gangrene may be due to embolism, autochthonous thrombi, endarteritis of the minute vessels and capillaries, and that spasm of the vessel seems to play a part.

The same etiologic factor can produce both aneurysm and gangrene and in the following unfortunate case an aneurysm of the external iliac artery and gangrene of an extremity occurred.

H. W., female, aged twelve years, admitted Sept. 1, 1930.

Complaint.—(1) Hemorrhage from the nose. (2) Fever. (3) Sweats. (4) Convulsion. (5) Weakness.

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Past History.—Rheumatic fever at four years of age (eight years previously). Has had heart trouble since, and has never been well. Tires easily.

Present Illness.—Severe nosebleed in June, 1930, lasting twenty-four hours, followed by frequent recurrences. Headaches from that time on. Has had a high fever for past two weeks, usually in the early morning, accompanied by profuse sweats. One week ago had a generalized convulsion, lasting for thirty minutes. Complained of dimness of vision this morning, marked thirst, and polyuria.

Physical Examination on Admission.—Very emaciated and acutely ill. Skin has a waxy, yellowish appearance. A few petechial hemorrhages in the skin. Mucous membranes very pale.

Heart.—Rate rapid and regular. Heart enlarged, both to left and right. Systolic and presystolic murmurs over precordium, loudest at apex.

Lungs.—Negative.

Spleen.—Not palpable.

Paralysis of left internal rectus of eyeball, and a slow lateral nystagmus.

Left patellar reflex less active than right. Sustained ankle clonus on left side and a positive Babinski on left side.

Hemorrhages in both retina, and edema of the optic discs.

Laboratory Findings.—W.B.C.—15,700. *R.B.C.*—2,250,000. *Hemoglobin*—34 per cent. *Differential*—W.B.C. *Polys*—81 per cent. *Small mono*—19 per cent. *Coagulation* time of blood—4 minutes. *Bleeding* time—one hour (stopped by pressure). Clot nonretractile. *Blood Wassermann*—negative. *Capillary resistance test*—+++. *Spinal fluid*—increased pressure and bloody. Supernatant fluid icteric. *Urine*—albumin, otherwise negative. Two blood cultures taken on successive days—second positive for Streptococcus viridans.

Course.—The temperature on admission was 104° F. and remained continually above normal throughout the hospital course, varying from 99.8° to 104° F. The radial pulse varied from 96 to 180. A transfusion of 300 c.c. of blood was given September third. On one occasion tarry stools were passed.

No particular change in her condition occurred until the fifth hospital day when she complained of pain and numbness in left foot, particularly the plantar surface; she could not distinguish sharp from dull objects applied to the plantar surface of this foot, and there was a loss of deep muscle sense, heat and cold sensation. In addition there was a crop of petechial hemorrhages in the skin scattered over the body. The following day, seventh hospital day, the little toe of the left foot was a purple color and the skin of the entire foot, up to about one inch from the malleoli was mottled with irregular purplish areas. Pulsation in the dorsalis pedis artery and in the popliteal artery was absent. There was great tenderness in the popliteal fossa. During the next two days there was a sharp, but irregular line of demarcation three or four inches below the knee. The skin below this line was of a dark purple color, very dry and parchment-like. September ninth (eighth hospital day) she had a generalized convulsion, following which ptosis of the right eye occurred. She complained of a severe headache; vomited a great deal, and had pain and some stiff-

ness of the neck. Lumbar puncture was performed and a small amount of fluid withdrawn. The fluid was bloody and the supernatant fluid ieteric. Cultures and smears of the fluid were negative.

During the next nineteen days her condition grew gradually worse. The leg became darker in color, the gangrenous area extending to the knee. Sloughing occurred along the anterior surface. She died on the thirty-first hospital day. (Figs. 1 and 2.)

Fig. 1.—Gangrene, which before death extended to knee.

Fig. 2.—Aneurysm of iliac artery.

PATHOLOGIC REPORT

The postmortem examination revealed a markedly emaciated eight-year-old female child. The changes of note externally were marked wasting of the subcutaneous tissue, deep set eyes, yellowish pallor of the skin, petechiae, ecchymoses, acrocyanosis, and dry gangrene of the left foot and leg below the knee. Small sinuses were noted at the line of demarcation between the living and dead tissue which contained purulent exudate. The major pathology was found in the cardiovascular system. The heart was enlarged, having a transverse diameter of 11.5 cm. at the level of the apex and 7.5 cm. at the waist. All chambers of the heart were moderately dilated and the conus was prominent. The pericardium was smooth and shiny except for a small area of thickening on the anterolateral surface of the left ventricle. When the right chambers were opened no gross changes were found other than slight dilatation of the pulmonic and tricuspid rings. The myocardium of the right ventricle

was thin, dull, and flabby. The left ventricle was rather firm and its myocardium dull. The mitral valve leaflets and the mural endocardium of the left atrium were markedly involved by reddish-gray and purplish verrucous masses. These vegetations were finger-like and friable. The mural endocardial vegetations extended from the posterior leaflet of the mitral valve to the orifice of the left pulmonary vein. The endocardium of the left ventricle and the aortic valve were unchanged. Following the vascular system, the intima of the aorta and the great vessels was seen to contain smooth, slightly raised, yellowish streaks, representing the fatty changes of beginning sclerosis. The left external iliac artery passed into a roughly spherical, fluctuant mass over the left iliopsoas muscle just above Poupart's ligament. This mass was about 8.0 cm. in diameter and displaced the internal iliac artery medially. Hemisection of the mass revealed the external iliac artery to be continuous with a dilated, thick-walled saccule filled with laminated purplish clotted blood. About the walls was considerable edema, hyperemia, and purulent exudate. At the opposite end of the saccule the femoral artery had its origin. The femoral artery contained some clotted blood. The localized dilatation of the left external iliac artery was 5.0 cm. in diameter and its intima was thickened and irregular

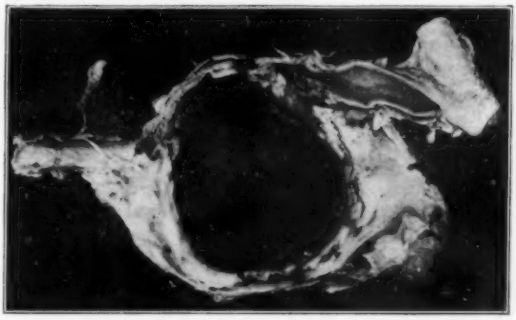

Fig. 3.—Specimen showing aneurysm of iliac artery.

(Fig. 3). The left popliteal artery contained a firm, gray clot which was adherent and completely occluded the lumen. The associated findings included multiple, firm, dark purplish, raised areas, with gray borders in the spleen; deep yellowish-gray, circumscribed areas in the kidney parenchyma; dull friable parenchyma in the liver; and dryness of all tissues. The examination of the brain disclosed additional findings. The arachnoid contained dilated veins, petechial hemorrhages, and flecks of pus. The entire brain was very dry. At the base were numerous patches of recent dark red hemorrhage and old yellowish brown blood pigment as well as purulent exudate about the optic chiasma, anterior and posterior perforated spaces, floor of the third ventricle, and the pons. The scant fluid at the base of the brain was purulent and bloody.

Microscopic examination of the tissues disclosed parenchymatous degeneration of the liver, kidneys, and myocardium; focal embolic nephritis; multiple anemic infarcts of the spleen. The sections of the wall of the aneurysm of the left external iliac artery revealed an endoarteritis evidenced by the vegetations of the intima which were made up of fibrin, polymorphonuclear leucocytes, and colonies of bacteria and the diffuse infiltration of the media and adventitia by polymorphonuclear leucocytes, red blood cells and edema. The occlusion of the popliteal artery proved to be an embolic thrombus, superimposed upon some fatty changes in the intima.

Pathologically, this is a case of subacute bacterial endocarditis of the mitral valve and mural endocardium of the left atrium; endoarteritis of the left external iliac artery with mycotic aneurysm formation; thrombosis of the aneurysm, embolic thrombus of the left popliteal artery; gangrene of the left leg; hemorrhagic and purulent meningitis; focal embolic nephritis; multiple infarcts of the spleen; parenchymatous degeneration of the liver and myocardium; anhydremia and emaciation. The embolic phenomena are widespread, reaching practically all regions of the systemic circuit. The aneurysm of the left external iliac artery is probably the result of endoarteritis which in turn had its origin in a septic embolus either in a vas vasorum or lodging on a fatty plaque of the intima.

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Medical Arts Building.

AN AID IN THE DIAGNOSIS OF A CERTAIN TYPE OF CONGENITAL ESOPHAGEAL STENOSIS*

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A FEMALE infant with a complete obstruction of the esophagus was admitted to the Children's Hospital, Cincinnati, Ohio, a few days after birth. Roentgenograms demonstrated that the upper end

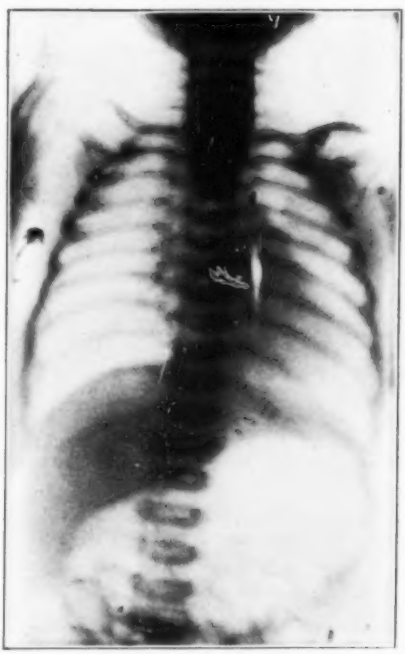

Fig. 1.—Roentgenogram of the first case, made nine days after birth. It shows barium sulphate in the upper segment of the esophagus, and the stomach distended with air.

of the esophagus ended blindly at the level of the third dorsal vertebra (Fig. 1). An interesting observation was that the stomach was distended with gas.

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When the infant was twenty-four days of age a Ssabanajew-Frank gastrostomy was performed. Following this it was observed that the baby strangled frequently and appeared to cough up some of the milk which was introduced into the stomach.

Death occurred two days after the operation. At necropsy the lungs were found to contain a considerable quantity of milk and there was extensive hypostatic pneumonia. The upper end of the esophagus ended blindly in the position shown in the roentgenogram. Just above

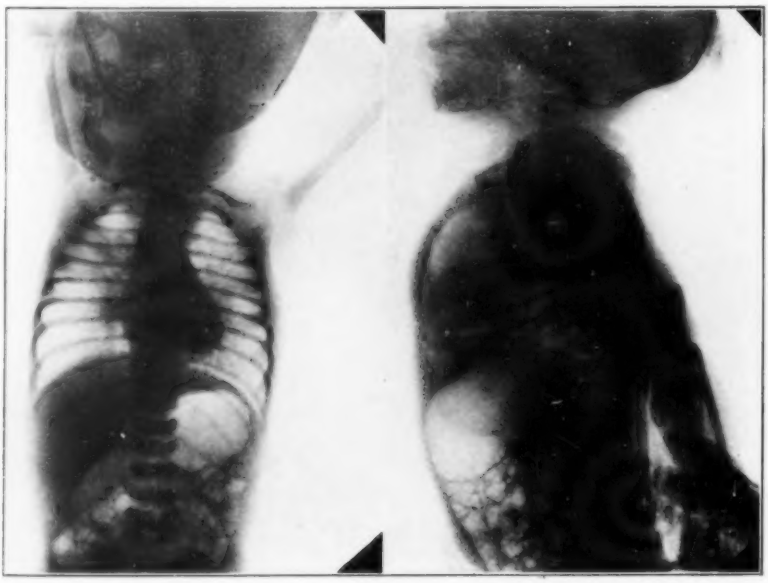

Fig. 2. Fig. 3.

Figs. 2 and 3.—Roentgenograms of the second case, made four days after birth. Note the blind upper segment of the esophagus and the stomach filled with air.

its bifurcation the trachea communicated with the lower end of the esophagus. The administration of milk into the stomach, therefore, resulted in an aspiration pneumonia.

There are presented also roentgenograms of another infant on whom a similar gastrostomy was performed at four days of age by Dr. John V. Goode, resident in surgery at the Cincinnati General Hospital. (Figs. 2, 3, and 4.) In this case there was a large amount of gas in the stomach before operation which it was believed was due to the existence of an anastomosis between the trachea or bronchus and the lower end of the esophagus. Here, too, the administration of milk into the stomach frequently caused coughing and strangling and the

child expectorated some sour milk. The patient died four days after the operation. The necropsy demonstrated an anastomosis between the trachea and the lower end of the esophagus and pneumonia in the right lung. The upper end of the esophagus ended blindly as shown in the roentgenogram.

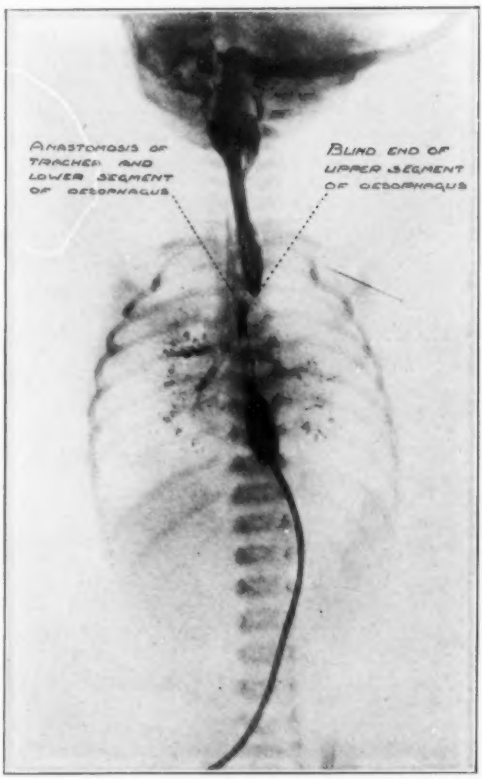

Fig. 4.—Injections of the second case with lipiodol immediately after death. Injections by Drs. Samuel Iglauer and Henry Freiberg.

SUMMARY

In congenital atresia of the esophagus, it is known that the lower esophagus not infrequently communicates with the trachea or a bronchus. When the roentgenogram shows the stomach to be distended with air, this developmental anomaly may reasonably be suspected. In such cases feeding through a gastrostomy rather tends to hasten death from pneumonia because of the regurgitation of food into the lungs.

This particular anomaly might be proved definitely by the injection of lipiodol into the trachea. In such cases the performance of a gastrostomy is not indicated. It is conceivable that feeding might be given through a jejunostomy, without regurgitation, until the infant could be gotten in shape for an attempt to close the fistula.

CINCINNATI GENERAL HOSPITAL.

ANTIQUES OF PEDIATRIC INTEREST*

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FOREWORD

In this series of articles there will be illustrated with short descriptions various antique objects of pediatric interest, not the "museum specimens" of the catalogers' descriptions, but specimens such as can be obtained by the amateur collector of moderate means. These objects have been obtained in the course of a few years from dealers in England, Germany, and France, entirely through correspondence. Catalogs from dealers in this class of material are rare, and the best results will be obtained by inviting offers from European antique dealers, whose names and addresses may be found in any of the antique and collectors' journals.

Ptah

Egypt, circa 400 B.C. Green earthenware, heights 5½ and 8 cm. Front and back views.

Ptah, the god of all handicrafts, the patron of workmen and artisans, retained his typically achondroplastic characteristics from 3000 B.C. down to the latest times. According to tradition the first temple erected in Egypt was one built in Memphis for his worship. In this city he was the greatest of the gods. In the creation of the universe Ptah was employed in fashioning the heavens and the earth. He made the great metal plate which formed the floor of heaven and the roof of the sky, and also framed the supports which upheld it. From the Book of the Dead we learn that Ptah was a great worker in metals and a master architect. The Romans identified him with Vulcan. In Egyptian tombs are found numerous earthenware models of this achondroplastic dwarf, who was believed to have power to reconstruct the decaying bodies of the dead.

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Critical Review

PROBLEMS OF THE NEWBORN

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INTRODUCTION

ANY one professing much interest in the newborn infant knows what a problem it presents because it occupies a "no-man's land" in the field of medicine and is ignored to a large extent by both the obstetrician and the pediatrician. Acknowledgment of this gross neglect is manifested by the recently awakened interest in the newborn infant throughout the world, and although some valuable contributions to the subject have been made there is still ample room for further study. The obstetrician often pays slight attention to the baby after labor, while the pediatrician, forced to accept the baby in the condition it is handed to him, has no prior opportunity to assist in its welfare, and probably at the present time would be incapable of being of much help if the chance were offered him. Present-day prenatal management has aimed chiefly at the reduction of maternal complications of pregnancy and the same can be said of intrapartum care, save for a few feeble attempts to prevent some of the neonatal sequelae of labor. Immediate postnatal care has been neglected generally except in a few of the larger hospitals associated with teaching institutions. The vital statistics of the newborn reflect clearly the situation that exists today in this field of medicine.

Advances in the knowledge of the newborn have failed to keep pace with that of other age periods because of the peculiar midposition the baby occupies in respect to the two specialties. The few studies made from time to time have been of a sporadic nature and have been handicapped by the difficulties entailed in making accurate examinations upon such small and uncooperative patients. With the inception of newer and more accurate methods of study and the development of instruments of precision, the results of many of the older investigations have become questionable, so that at present what little is known about the newborn infant is so uncorrelated and contradictory as to be largely worthless.

What is the result of this confused state of affairs? The mortality rate of the neonatal period, which is limited to the first month or possibly six weeks of life, has not changed materially in the last twenty or even fifty years.[1] While it should have been lowered considerably by improved feeding methods, as with the older infant, popularization of certain obstetrical fads throughout the country has served to counteract much of this effect. Morbidity rates are nearly impossible to obtain but there is no reason to suppose that they have been improved by the omnipresent tendency to use pituitary extract ill-advisedly, to institute manipulative procedures *ad libitum* regardless of the competence of the operator, or to adopt routine methods of anal-

gesia and anesthesia without proper consideration of the possible consequences to the child. Such tendencies may possibly lead some later-day critic to observe that effective teaching of obstetric principles of this period was marred by exploitation of obstetric innovations. Those who have been instrumental in causing the medical profession to adopt such methods must be criticized for promulgating procedures which possibly in their hands alone might be safe.

The unchanging maternal and infant mortality rates have laid the medical profession open to a great deal of lay criticism of obstetric practices in the United States, criticism which to a considerable extent has been justifiable. Popular magazine writers have been furnished a welcome opportunity to flay the doctor in their inimitably sensational style with characteristic disregard of extenuating factors. The medical profession honestly admits that 200,000 fetal deaths a year is too high, but it will not concede that this large number of deaths is preventable or will ever be under the most skilled care. While the doctor is ready to acknowledge his share of the blame for the high mortality rate he demands that the public should be made aware of the fact that it is equally to blame because of the hampering effects of its indifference and ignorance. Paradoxically the laity demands better obstetrics and at the same time cries for labor-saving and pain-saving methods which so far have been instrumental to some extent in increasing the mortality and morbidity rates. The possible danger of such procedures is recognized by the physician but not by the public, and evaluation of the safety of various methods should be left to him. For this reason there is no excuse for the lay articles upon the subject which appear from time to time. It is unfortunate in all this discussion of fetal death rates that practically nothing authentic can be said about morbidity rates. Were the people to realize the fact that many times death is to be preferred to life they, perhaps, might not be so critical as they are at present regarding the neonatal death rate.

Public recognition of the great incidence of feeble-mindedness has made the nation alert to the needs of adequate institutional management of these unfortunates. This kind of care constitutes a great economic waste (we say this advisedly) which is increasing by leaps and bounds to the impassioned cry of a sympathetic public for more asylums for the feeble-minded. Such institutions, costly to build and to maintain, must be considered largely monuments to obstetric neglect by both the laity and the profession.

The fate of the newborn infant rests chiefly with the general practitioner, for he confines most of the women of this country. The mortality and morbidity rates cannot be reduced save by the concerted efforts of these men to improve maternity conditions throughout this country by educating the people to the necessity of proper prenatal and natal care and to the dangers of many of the questionable innovations. The doctor's ability to accomplish this in turn must depend upon more comprehensive and authentic knowledge of the infant before and after delivery, which can be achieved only when medical colleges are roused from their present lethargy in respect to this branch of medicine. The public's responsibility is more difficult to deal with because of the gullibility with which it welcomes the profusion of misinformation published by unqualified writers.

NEONATAL MORTALITY AND MORBIDITY

Recent reports continue to emphasize the high mortality rate at this age of life. Lyon and Bemis[2] found a corrected mortality rate of 1.95 per cent in 6,000 consecutive deliveries, while Grier[3] reported an uncorrected mortality rate of 4.8 per cent in a series of 4,668 deliveries.

The incidence of spontaneous abortion among patients cared for by Grier's associates was 11 per cent. The addition of this to the 5 per cent death rate in babies born after the period of viability fully justifies his statement, "The fact that at least 16 per cent of women who come to us for confinement do not receive a living baby seems appalling."

Prematurity still accounts for a tremendous number of newborn deaths. Grier found that 42 per cent of the fetal deaths occurred in infants whose gestational age was seven and one-half months or less. Lyon and Bemis found that one-half or even more of the premature deaths were found at autopsy to be the result of intracranial injury, which is consistent with the findings of many earlier observers. These observations make it evident that reduction of the number of premature labors would be one of the most effective ways of decreasing the death rate of the early days of life.

Operative deliveries account for too many neonatal deaths not to repeat the warning against the increasing tendency to resort to them upon slight provocation. The possible effect of such manipulations upon the baby should always be carefully taken into consideration. In Grier's study forceps deliveries accounted for 23 per cent of the fetal deaths while breech extraction with or without version and extraction was responsible for 25 per cent. The statistics of Lyon and Bemis corroborate these findings with a death rate of nearly 50 per cent for deliveries by forceps, versions and extraction, and cesarean section. Gibberd[4] found the neonatal death rate of breech deliveries in several large London hospitals to be 15 per cent in multipara and 28 per cent in primipara. At least 5 per cent of those that lived were seriously injured.

The fetal death rate in the preeclamptic toxemias and especially in eclampsia is higher than normal. Tyson and Bowman[5] believe that in such cases prematurity is more likely to be the actual cause of death than the debilitating effects of the toxemia. Whatever the cause, proper prenatal care has proved invaluable in reducing the incidence of the toxemias of pregnancy.

During the past few years reports have been published of damage done to the growing fetus by therapeutic doses of radium and roentgen rays. There seems to be a predilection for the tissues of the central nervous system. Many of the cases described were anencephalic monsters, or showed anomalies of the brain and its coverings, although other developmental abnormalities have been mentioned. Findlay[6] states that therapeutic irradiation is not dangerous before conception and that diagnostic use of the roentgen rays has not been known to affect the fetus deleteriously.

The report of thirteen cases of aniline poisoning caused by clothing babies in unwashed linen which had been freshly stamped emphasizes

again the advisability of washing all new clothing before using. The cases described by Weinberg[7] showed marked cyanosis, rapid respiratory and heart rate, and cold extremities. Methemoglobin was found in the blood. Fortunately, all of the infants recovered rapidly.

The influence of pituitary preparations administered during the second stage of labor upon the mortality and morbidity rates has never been properly evaluated. Its injudicious use has, undoubtedly, played a great part in the death and maiming of many babies. The cautious and indicated use of the extract may possibly have reduced the number of deaths by obviating the disastrous effects of protracted labor and forceps operations, but in spite of this one is forced to believe, from personal observation and stories of its use, that the good effects have been more than overshadowed by the catastrophies from misuse. Another ecbolic of common usage may not be as innocuous as it is usually thought to be. Fetal deaths have been reported from time to time due to the use of quinine to induce or hasten labor. Sadler, Dilling and Gemmell[8] in a study of 805 cases of quinine induction found 6 deaths which in all probability could be attributed to this method of induction and 5 more in which death from this cause was likely. There was more meconium in the liquor amnii after the use of quinine than in cases where none was used. They felt that accumulation of the drug in toxic amounts in the fetal tissues was possible.

Older vital statistics show that a great number of fetal deaths were attributed to congenital defects, especially those of the heart. Cyanosis during the early hours of life in the presence of a heart murmur of varying intensity seemed to offer sufficient evidence of congenital heart disease to warrant this diagnosis on the death certificate. The past decade has seen a decrease in this tendency due to the greater incidence of postmortem examinations which have shown that other causes of death are more common. Thus, necropsy reports of 800 infants dying in the first four weeks of life revealed that 540 were due to asphyxia, atelectasis, birth injuries or prematurity, 230 to infections, and only 22 to developmental defects. (Cruickshank.[9]) The small number of deaths due to developmental defects should open our eyes to the fact that congenital defects cannot be given an important place among the causes of neonatal death. The conditions which account for the greatest number of deaths are largely preventable.

Birth trauma has occupied a prominent place in the literature of the last ten or twelve years because of its known effects upon the intranatal and neonatal mortality and morbidity rates. Ehrenfest[10] in a report to the White House Conference for Child Health and Protection summarizes the situation clearly. Vital statistics fail to disclose the actually prevailing conditions since this type of injury only rarely manifests pathognomonic symptoms and clinical findings. Sometimes exhaustive postmortem examinations are necessary to discover the existing pathology. It has been shown that 80 to 90 per cent of the deaths following breech deliveries and particularly after versions are due to trauma. Necropsies upon stillborn and those dying in the first days of life show the cause of death to lie within the cranium in 25 per cent with another 25 per cent revealing intracranial damage which cannot be positively accepted as the cause of death. It is likely that

only relatively few traumatizations are fatal since injuries are slight in many cases and are never recognized as such. Others give some signs of injury followed by later sequelae.

The relation of nonfatal intracranial damage to mental deficiency is of great practical interest. Schroeder[11] found behavior problems the direct result of mental retardation which in turn was greatly influenced by difficult labor. Children with cerebral birth injuries but no palsies showed behavior characteristics and mental retardation similar to those with birth palsies. This is not in accordance with the findings of von Reuss[12] in respect to premature infants or those of Dayton[13] who found that there is no relation between difficult labor and the bulk of cases of mental deficiency in the Massachusetts public schools. There was definite association between abnormal labor and the dull normal or low normal group, neurologic defects and some of the personality traits. These observations are hard to reconcile with our present ideas of the danger to the brain from intracranial hemorrhage and our anatomical observations of the brains of children dying from this condition. It must be remembered that a large number of those who suffer brain injury at birth either succumb at an early age or do not attain sufficient intellect to be sent to school.

While our knowledge of intracranial hemorrhage has been greatly enhanced during the past few years as far as therapy is concerned little can be done and the results obtained from the few therapeutic measures at hand are in many instances far from happy. The whole problem is one of prevention, which is not the task of the pediatrician but of the accoucheur. This can be accomplished by prophylaxis of prenatal infections, of the toxemias of pregnancy, the prevention and early treatment of syphilis, all of which are vital factors in the causation of prematurity, and the early recognition of pelvic contractures and the adoption of sane principles about operative obstetrics and the use of pain-relieving measures.

Ehrenfest's concise statement of the situation should be read by all: "In view of the unmistakable relation of traumatization of the child to artificial delivery, the rapid growth of an operative trend in the obstetric practice of this country cannot fail to prove alarming. Various reasons for this phenomenon can be readily recognized, some fully justified, others intolerable. But whether the blame rests with the physician or the patient, it seems that excess in this respect could best be curbed by wide propagation among women of this country of the fact that ready compliance with their ever-increasing insistence upon a short and comfortable labor is not fully compatible with the principles of sane conservative obstetrics and inevitably implies certain risks to themselves and their infants." This statement implies much more than is apparent unless one reads between the lines. It decries wholesale versions and cesarean sections upon questionable indications as performed by some who have a vast clientele to practice upon and who are thus able to develop unusual skill. Operations of this kind cannot be treated so lightly by the vast majority. Those skilled ones who broadcast far and wide their low mortality rates following such procedures have a pernicious influence upon their imitators. It must be remembered also that while the mortality rates reported by these men

may be low, the morbidity rates are always questionable. The report of Ehrenfest probably because it was made to a mixed lay and professional audience only mildly criticizes the use of pain-relieving measures which have become the mode today as much through lay demand as medical desire. The remarks of Epstein and Fischer[14] are less kind: "The female of the species has not been created and dedicated to the ultimate purpose of being a subject of the practice of faddists be they sponsors of prophylactic forceps, delivery by routine version, or preachers of the gospel of cesarean section as the easiest way out."

Such remarks should serve as a definite warning to all those engaged in obstetrics. When the little-known fact, that the United States urban death rates for mother and child are much higher than the rural rates, is taken into consideration it is not difficult to see where much of the blame lies. If we are to get anywhere in the attempt to lower the enormous death rate in the first few days of life it must be chiefly through a widespread effort upon the part of the obstetrician and the general practitioner. Failure to accomplish this reduction, of necessity, must be considered an indictment of these men.

THE PREMATURE INFANT

During the past few years further investigations of the ultimate fate of the premature and immature infant have been undertaken. These reports made in different clinics upon children of different ages appear somewhat contradictory until scrutinized more carefully. Capper[15] made a painstaking investigation of the immature infants cared for by the Children's Clinic of the University of Vienna following them up to the age of 14.5 years and in two cases up to 17 years and 19.5 years respectively. This study is probably the most extensive one up to the present time as far as the number of years the children have been followed is concerned. One-half died in the first year which is a lower figure than usually given. Capper found that the death in the first week of life was usually due to intracranial hemorrhage and a close relationship between the degree of development of the immature infant and the occurrence of hemorrhage within the cranium could be demonstrated. The immature infant lagged behind the normal both in gain of weight and height up to and even beyond puberty, remaining more subnormal in weight than in height. The smaller the infant at birth the greater the subsequent deficiency. The majority of these children belonged to the asthenic type and since their backwardness was not overcome by puberty it probably could be considered permanent. The immature infant was found to have little resistance to infection during the first year of life with predisposition to infections of the respiratory tract. The majority were mentally underdeveloped, some showing mental retardment, while others showed permanent and severe mental disease. The following conclusion was reached: "In brief, the immature infant becomes the backward school child, and is a potential psychopathic or neuropathic patient and even a potential candidate for the home for imbeciles and idiots." His report confirmed the old dictum of Ylppö that raising of weak premature infants could not be deemed sociologically or hygienically advisable.

Mohr and Bartelme[16] studying a younger group of premature infants who had had superior care did not find the mental records of their patients as disheartening as Capper. Comparing these infants with 40 siblings who had been full-term babies they found that if due allowance were made for the period of prematurity there was no difference between the two groups in respect to mental age, time of eruption of teeth, onset of walking, and the rapidity of learning bladder control. The "personal-social" behavior of the premature was consistently relatively superior, probably because of more unusual care and attention. These findings agree with those of Sarvan[17] who found no greater percentage of social misfits among his group of prematures than among normal infants, and with Osselmann[18] and Gries[19] who found no mental abnormalities in their patients.

Regardless of whether the premature infant is mentally fit when given care of a sort difficult or nearly impossible to imitate in every corner of the world or whether it is a potential candidate for a feeble-minded institution the fact remains that its life is a hazardous one. There are many handicaps to prematurity that cannot be ignored:

1. There is an extremely high death rate in the early days, which is due to the great incidence of intracranial injury, asphyxia, and respiratory infections, and which is directly dependent upon the gestational age.

2. Gastrointestinal immaturity, and muscular weakness creates a feeding problem of many of these infants.

3. There is a predisposition to rickets which is difficult to control and to an anemia which is nearly impossible to combat for months because of immaturity of the hematopoietic organs.

4. These children are physically substandard up to puberty if not throughout life and, therefore, their life expectancy must be below normal.

The handicap of prematurity is a problem even in institutions capable of giving these unfortunates exceptional care. When it is considered that the majority of premature infants throughout the country cannot receive such attention the handicap becomes all the greater and there is an inclination to agree with Capper and Ylppö. However, there is no good reason why facilities for the care of these infants cannot be improved. The authorities of smaller hospitals in some localities may feel that they cannot afford expensive incubators or warm beds. Such contrivances are not essential for adequate care of the premature infant. Parmelee[20] describes an inexpensive incubator used to exclusion at the Presbyterian Hospital, Chicago, which could be made part of the armamentarium of any hospital. If this simplified incubator cannot be obtained, warm beds which are heated by bottles filled with warm water or by electric light globes can be improvised. Caution should be used to prevent short circuits if the latter are chosen. Electric pads are not advised because of the danger of short-circuit fires.

There are certain basic principles to be followed in the care of the premature infant:

1. Normal body temperature should be maintained by well ventilated incubators or warm beds.

2. Asphyxial attacks should be treated by oxygen, carbon dioxide and oxygen, or possibly by hypodermic administration of small doses of lobelin.

3. Breast milk is the food of choice and should be given in the proportion of 120 to 150 calories per kilogram or 50 to 70 calories per pound in twenty-four hours. Measurement of the food intake is essential.

To these may be added:

4. Premature infants should be handled as little as possible, and removal from incubators should be avoided as much as is consistent with proper care.

5. Overfeeding and feeding too frequently should be avoided.

6. When the food supply is known to be adequate, the desire to force a rapid gain in weight should be withheld.

7. The premature will manifest a greater tendency to gain normally when its gestational age reaches full term.

The practice of these principles will do much to improve the outlook for the premature infant. Probably one of the most egregious errors of judgment is the attempt to make these babies gain weight rapidly in the first weeks of life by overfeeding and frequent feeding. This lowers the tolerance for food, paves the way for long-continued feeding difficulties, and causes them to lose weight from too much handling. A little patience in this respect often makes the difference between a feeding problem and an uneventful period of prematurity with a normal gain in weight.

According to foreign reports, and the same probably holds true for this country, prematurity is on the increase. If this is the case there is all the more reason to emphasize what is after all the only solution of the problem—prevention. Capper sums up the situation briefly in this way: "Efforts should, therefore, be directed not only to the care and preservation of the immature child, but more especially to the prenatal care and hygiene of the mother, prevention of maternal infection, and correction of anomalies of the birth passages before pregnancy." To which should be added the prevention of the toxemias of pregnancy. At present when the cause of prematurity is doubtful in 50 to 80 per cent of the cases, there is great need for further investigation of this phase of the problem.

ASPHYXIA NEONATORUM

Prevention of asphyxia is the job of the accoucheur. His ability to do this depends upon manifestation of more interest in the newborn than is the case at present, and by judicious use of the many obstetric procedures at hand. The physician should anticipate asphyxia in order that all necessary preparations for resuscitation can be made. This demands early recognition of the factors which are responsible for asphyxia. Kosmak[21] divides these into several groups:

1. Before delivery: from interference with the umbilical circulation by knots, pressure, prolapse, rupture, tetany of the uterus, low implantation and premature separation of the placenta, and from narcosis, analgesia or anesthesia of the mother.

2. During delivery: from prolonged pressure upon the head in protracted labor, during version and extraction, or during forceps delivery, and from premature inspiratory efforts.

3. After delivery: from injury to the cerebral vessels by sudden

compression or release as the head passes through the birth canal, injury to the cord or head during version, and from forcible efforts at resuscitation which aggravate a preexisting injury.

4. Prematurity due to defective development of the respiratory mechanism.

5. Asphyxia from the use of analgesics and anesthetics.

It is not possible in the presence of immediate asphyxia to go into much diagnostic detail but when cyanosis is persistent, intermittent or tardy in appearing there are certain signs and symptoms of some value in determining its source. There may be a weak and grunting cry, with rapid shallow respirations and a cough. Occasionally, especially if atelectasis is extensive, the percussion note is dull, the breath sounds decreased and the so-called "atelectatic crackling" râles audible. Unfortunately these are not observed with sufficient regularity or definiteness to make a positive diagnosis with any great frequency. Weymüller,[22] his associates, and Dunham[23] draw attention again to the efficacy of the x-rays in differentiating the cyanosis of atelectasis from other forms in the newborn infant. The roentgenologic findings are those of localized or generalized haziness from incomplete äeration of the lungs, with abnormal shape of the thorax and position of the ribs from incomplete expansion of the lungs. Some years ago Wasson described a sign of great value in the diagnosis of atelectasis. In fully expanded lungs the ribs form a right angle with the vertebral column, while in atelectasis the angle is more acute. The roentgen rays would also be of definite value in making a diagnosis of pneumonia, pneumothorax,[24] thymic enlargement, empyema,[25] cysts,[26] and diaphragmatic hernia, the first of which is unusually common.

The more or less generalized practice of resuscitating asphyxiated infants by methods more notable for their spectacular violence than the results obtained has been the subject of denunciation from time to time. In spite of this the use of vigorous external stimulation by slapping the up-ended baby, swinging it between the legs after the method of Schultze, or plunging it into a cold bath still prevails, undoubtedly, accounting for the unnecessary death of a goodly number of babies each year. In the presence of intracranial injuries such procedures are all the more dangerous. Even rhythmic compression of the chest, which cannot possibly favor the entrance of air into a collapsed lung, serves only to pump blood into the already damaged head and brain. (Crothers.[27]) The recent universal condemnation of resuscitative measures of violence is to be praised because certain improved methods have been offered as substitutes. Considerable headway has been made in the resuscitation of asphyxiated infants by popularization of the carbon-dioxide-oxygen inhalation method advocated by Yandell Henderson and his coworkers.[28]

There is no doubt that primary or secondary respiratory failure with inadequate expansion of the lungs and subsequent pneumonia is responsible for a large number of deaths in the early days of life. Carbon dioxide in increasing doses up to 10 per cent stimulates respiration, while above that a depressant effect is noticed with narcosis at 15 to 20 per cent and death at about 30 per cent. A partially asphyxiated respiratory center is a depressed one which requires more carbon dioxide to stimulate it. Acting upon this knowledge Henderson proved

to his satisfaction and that of many others that the administration of carbon dioxide up to 10 per cent, together with oxygen, stimulated the sluggish respiratory center. For those infants who did not breathe he advocated forceful inflation of the lungs with this mixture. Many infants who breathed spontaneously but inadequately were given carbon dioxide intermittently during the early days to stimulate deep breathing in order that any atelectatic areas might become properly äerated to prevent intervening pneumonia. A special inhaler was devised for use in the birth room and nursery and Henderson urged legislation making inhalational prophylaxis of asphyxia neonatorum compulsory. The efficacy of this method has been vouched for enthusiastically by many physicians throughout this country and abroad, and has come into extensive general use. (Coryllos,[29] Wiener.[30])

During the enthusiasm with which new methods are accepted by the profession ofttimes certain questions arise which are lost sight of for the moment. It must be remembered that aspiration of amniotic fluid, vernix caseosa, lanugo hairs, epithelial cells and even portions of amniotic sac furnishes one of the common causes of pneumonia in the newborn. Farber and Sweet[31] found amniotic sac contents in the lungs of 88 per cent of 124 infants. Large amounts were present in 15 per cent. The inhalation method of Henderson does not furnish a means of removal of these infected substances from the respiratory tract of the infant, in fact, it may further their extension. The patently obvious necessity of removing amniotic fluid and other detritus from the mouth, nose, trachea and bronchi before any attempt is made to correct the deficiency in respiratory gases has been especially emphasized by Cron[32] and Flagg.[33] A common soft nosed rubber ear bulb may be used to remove mucus and débris from the upper air passages as soon as the head is born, provided caution is used in preventing damage to the mucous membranes of the mouth. A size 12 French soft rubber catheter may be attached to the syringe if desired. After birth the baby may be held with the head lower than the body while the larynx and trachea are milked toward the mouth. Then the bulb should be resorted to again or if the mucus is especially abundant aspiration with a tracheal catheter may be indicated. Flagg has devised a simple laryngoscopic method which should prove valuable. The larynx is exposed so that obstructing materials may be removed following which a tracheal tube is inserted for the purpose of insufflation.

A plea for caution is always necessary whenever mechanical inflation of the lungs is advocated whether by tracheal catheter, inhalator, pulmotor, or by mouth-to-mouth insufflation, since all of these methods have played their rôle in causing the death of newborn infants by rupture of the pulmonary alveoli with resulting pneumothorax or even emphysema of the tissues of the chest wall. Such a warning cannot be repeated too often for during the excitement of resuscitation the operator frequently fails to appreciate the force with which air, or the resuscitative gases are sent into the lungs. The fatal results of such measures are rarely made known if recognized and many, of course, are not. For this reason the paucity of reports of such events cannot be considered indicative of their rarity. Thus Rogatz and Rosenberg[34] found that only five cases of acute pneumothorax in the newborn had

been described. Sorrentino[35] reported another due probably to a convulsion immediately after birth. The fact that Standler, Davis and Stevens[36] observed spontaneous pneumothorax in 1 per cent of a series of 702 routine roentgenologic examinations after birth shows that it is more common than ordinarily supposed. We have observed this condition occasionally and in a recent case there was asymptomatic persistence of a localized area of pneumothorax at the end of two months. Rupture of the pulmonary alveoli during resuscitative efforts might account for the air in the pleural cavity, although it is possible that it comes from spontaneous rupture of some of the marginal emphysematous vesicles so commonly seen at autopsy. No matter what the cause the presence of this condition in such a percentage emphasizes all the more the delicacy of the pulmonary structures. Emmert[37] feels that mouth-to-mouth insufflation of the lungs should be abandoned in general practice unless the most painstaking precautions are used. The same can be said for intratracheal insufflation. When it is considered that 15 to 20 c.c. of air under a pressure of 15 to 20 mm. of mercury is all that is necessary to inflate the lungs of the newborn infant sufficiently to stimulate respiration, it can be readily seen that a great deal of care must be taken when these procedures are instituted.

Many times the symptoms of asphyxia neonatorum are due to intracranial hemorrhage in which case the failure of the respiratory center to act is probably not as much due to lack of irritability from carbon dioxide depression as to anemia of the medulla oblongata from increased intracranial pressure. While the use of carbon-dioxide-oxygen inhalations is of undoubted transient value in such instances there is a large number which would fail to react permanently to this form of treatment alone. Repeated cyanotic attacks in the first few days of life suggests in most cases that simple asphyxia is complicated by intracranial hemorrhage and that certain measures should be instituted for the relief of this condition. Release of excessive intracranial pressure by lumbar puncture or possibly cysterna puncture and intramuscular injections of whole blood would seem to be indicated as adjuncts to the use of carbon dioxide and oxygen therapy.

At first expensive inhalators were devised to dispense the carbon dioxide and oxygen in the correct proportions but now these instruments are not particularly essential for tanks of the mixed gases may be purchased at medical supply houses. Two different mixtures can be procured, one with 5 per cent carbon dioxide and 95 per cent oxygen and the other with 10 per cent carbon dioxide and 90 per cent oxygen. The pressure from the tanks should be reduced during administration by running the gas through a water bottle or into a small rubber bag.

Eastman[38] studies of the fetal blood in asphyxia led him to question the value of Henderson's method. He found that there was a characteristically low carbon dioxide content of the blood in severe asphyxia neonatorum with an increase of acid content—that is an acidosis. This would indicate that the use of carbon dioxide is superfluous or even harmful as it tends to aggravate an already existing acidosis. He

concludes that the chief therapeutic indication is for oxygen (air) and that the method by which it is administered is of minor importance so long as sufficient amounts of the gas are supplied the infant whose air passages have been previously cleared of obstructing materials.

What will be the outcome of these contradictory findings is hard to predict. Certainly there seems to be plenty of clinical evidence of the efficacy of carbon dioxide in the treatment of asphyxia of the newborn but it is quite possible that the results are due to the use of oxygen rather than the combination of oxygen with carbon dioxide. The fact that the blood determinations in asphyxiated adults and newborn infants are dissimilar does not invalidate either of these findings necessarily, nor does disagreement between laboratory and clinical observations mean that the latter should be ignored. Until the question has been settled it would be wise to continue the use of the 5 per cent mixture of carbon dioxide and 95 per cent oxygen. If Henderson's energetic plea for this method of resuscitation of asphyxiated infants is of no more value than some other measures at least it has served as a tremendous stimulus in focusing the attention of the medical profession upon this neglected cause of neonatal death.

The Drinker respirator, which has attracted so much attention in treatment of the respiratory paralysis of acute anterior poliomyelitis, has been used in modified form by Murphy and his associates[39] in the treatment of asphyxia neonatorum. They found it of distinct value in the treatment of immediate asphyxia and in maintaining pulmonary ventilation in premature and immature infants who suffered from respiratory failure appearing some hours or days after birth. The principle of the apparatus proved sound, and it offered an instantaneous method for creating a satisfactory degree of pulmonary ventilation in which the force could be controlled and measured accurately. This method should not be instituted until any material occluding the upper air passages has first been removed. The apparatus has been criticized because it fails to regulate the carbon dioxide content of the circulating blood. Because of the reputed success of this method in the face of this criticism the question of the necessity of carbon dioxide is raised again. The chief drawback to the use of the Drinker apparatus is its costliness, otherwise this method would probably be the one of choice. However, the very fact that there are several mechanical devices to choose from indicates that there are imperfections in all.

Injections of lobelin, which is claimed to be a central respiratory stimulant, have been given with apparent success in many instances. At other times it seems to be valueless. Certainly its administration intramuscularly or by injection into the umbilical vein is a simple way to try to stimulate respirations, and in the absence of some of the complicated devices it seems worthy of trial. The drug is relatively safe except when given in large doses or too frequently. Lee[40] attributes the death of two babies to the use of this preparation. The symptoms were twitching, rigidity, opisthotonus, and vasoconstriction of the peripheral blood vessels. We have observed similar symptoms in patients due to massive subdural hemorrhages where no lobelin was used.

After acknowledging the obvious necessity of prevention, there are certain principles which should be applied universally in the treatment of this condition when present, regardless of the ability to subject all of these infants to the luxury of the various mechanical devices:

1. All measures of a violent nature should be prohibited.
2. Absolute rest, warmth and quiet should be supplied.
3. The air passages should be cleared immediately.
4. Adequate fluid intake should be maintained.
5. Oxygen or regulated doses of 5 per cent carbon dioxide and 95 per cent oxygen may be administered.
6. In the absence of the gases, extremely gentle intratracheal insufflation of air or possibly mouth-to-mouth insufflation may be permissible.
7. The administration of lobelin in moderate doses may be tried.
8. Asphyxia complicated by evidence of intracranial pressure seems to justify immediate treatment either by whole blood injections, removal of an adequate amount of cerebrospinal fluid or both.
9. Recurring attacks of asphyxia should receive the same close attention that initial asphyxia does.
10. Roentgenograms of the chest are of great value in determining the cause of cyanosis.

INFECTIONS

Lack of resistance to infections is a characteristic of the neonatal period. Observation of greater susceptibility among the artificially fed has resulted in considerable discussion about the transfer of immune bodies from the mother to the baby by the way of colostrum and breast milk. While there may be an appreciable amount of these substances in human milk there is no reason at present to believe that they are effective in the production of immunity. The rôle that breast milk plays is probably only a nutritive one, thus enabling the tissues to become more resistant to infection. Musselman[41] believes that the newborn is entirely independent of the mother in respect to antibody formation and that both colostrum and breast milk have little bactericidal action.

Reports of the high incidence of pneumonia in the newborn have been frequent in the last few years. Most of the autopsy records show that 10 to 15 per cent of the early neonatal deaths are due to pneumonia, although one observer was able to find 42 per cent when he began to examine the lungs more carefully. Since the macroscopic appearance of the lungs does not reveal the presence of the condition histologic examinations are often necessary to make an absolute diagnosis. While evidence of pneumonia is found in a large percentage of the lungs of dead newborn infants it is unlikely that this disease furnishes the actual cause of death in the same percentage. The absence of fever and the usual signs and symptoms of pneumonia often make a clinical diagnosis impossible. The relation of atelectasis to pneumonia has been mentioned previously.

Among the most bothersome infections of the newborn period is pemphigus neonatorum or impetigo contagiosa neonatorum. It is a

highly contagious and infectious skin disease tending to appear in epidemics which are extremely difficult to control. The staphylococcus is the usual offender; when the streptococcus is responsible the disease is usually fatal. The lesions begin as discrete, pus-filled blebs of varying size situated upon a red and slightly indurated base. Later there is a tendency for them to spread and to coalesce into large bullae which rupture, leaving a raw, reddened surface. The presence of one case in a nursery usually forecasts the appearance of others within a short time. Hospital attendants view these cases with alarm because of the great difficulty in preventing the spread of the disease. Few maternity departments escape occasional epidemics and many times it has been necessary to close such divisions before the infection could be stamped out. While the mortality rate has been low in most of the recent epidemics there is always the fear that the fatal form may appear. In my experience late death from intercurrent infections following a pemphigus infection are more frequent than ordinarily supposed.

One of the most disturbing elements in the disease is the reaction of the public to hospital epidemics. Many parturients have refused to enter maternity hospitals because of the presence of an epidemic of pemphigus neonatorum and truly one cannot criticize them for this attitude. Sometimes misinformation regarding the etiology of the disease, which has come from professional confusion of this form of pemphigus with the syphilitic form, has resulted in rumors of the prevalence of venereal disease among the babies of a maternity hospital.

All manner of treatments have been advocated and as many measures to prevent the spread of the disease have been suggested, yet epidemics have continued to appear. The practice of most rigid asepsis in the care of the infant during and after delivery has achieved little in the way of prophylaxis of this infection. Lately, however, the introduction of antiseptic measures has met with considerable success. Using the following technic Chadwell[42] reports excellent results over a period of six years in many lying-in hospitals in New England which prior to that time had been embarrassed by frequent epidemics:

An initial soap and water bath following which no water is applied to the skin during the infant's stay in the hospital.

Following the soap and water bath the entire body is vigorously anointed with a 5 per cent ammoniated mercury ointment, taking care to rub the ointment in, particularly in the axillae and groins.

The subsequent care of the skin consists of daily sterile cottonseed oil rubs. The buttocks and genitalia should be invariably cleansed with absorbent cotton moistened with this sterile oil.

The infant should be carefully inspected daily and any suspicious lesions should be isolated.

Infants who develop the disease are cared for in the following manner:

All vesicles or blebs are evacuated and 5 per cent ammoniated mercury ointment is thoroughly rubbed into and about the infected area twice daily until the lesion is healed.

For three successive days daily inunctions of 3 per cent ammoniated mercury ointment are given. Exposed babies may be given similar treatment.

If no further lesions develop the baby may be returned to the nursery. Continued use of the sterile oil bath is advised for three months or longer.

We have used this method successfully over the past year during a time when pemphigus was prevalent in the community and can recommend it. At present a 3 per cent ammoniated mercury ointment is being used successfully. While it may be safe to return babies to the nursery three days after there has been no recurrence of the disease it seems far more safe not to permit their return to the newborn department at all. Early isolation of any suspicious skin lesion is one of the most important principles to follow in preventing the spread of this disease and it should be strictly adhered to. There should be no need of repeating the warning of the danger of permitting child visitors in maternity departments but, unfortunately, this is still permitted in many hospitals. Children are potential sources of infection and contagion and it has been my observation that during the period when pemphigus neonatorum is of frequent occurrence the common impetigo contagiosa of older children is prevalent in the community also. There seems to be more than a casual relationship between these two conditions.

Other methods of care of pemphigus neonatorum have been advocated. Swendson and Lee[43] use sterile liquid petrolatum containing 1 per cent copper oleate for the initial oil bath and after the daily water bath dust the entire body with a powder containing three parts of mercurous chloride, two parts talc and one part zinc oxide. Active lesions are opened with a cotton applicator soaked with alcohol, the base swabbed with 5 per cent silver nitrate solution, and the entire body dusted with the powder mentioned above. I have had no experience with this method of treatment but the reports regarding it have been encouraging. Certainly these curative measures have been more successful than the baths in various antiseptic solutions formerly used.

The frequency of thrush or "white mouth" among newborn babies was markedly reduced many years ago by teaching that it was not only unnecessary but dangerous to swab or wipe out the mouth. The habit of wiping out the mucus found in the mouths of infants immediately after birth is still practiced by many physicians. This may injure the oral mucous membranes and furnish an atrium of infection for the thrush fungus. This practice probably explains the frequent occurrence of thrush in newborn infants. Gentle aspiration by catheter or ear bulb as suggested before would be a more efficacious and less damaging way to remove the mucus. The usual therapeutic remedies, such as boric acid and the alkalis have not been especially effective and in some instances they have seemed to promote growth of the fungus. Some years ago Faber and his associates[44] recommended swabbing the mouth with a 2 per cent aqueous solution of gentian violet. Personally the use of this dye has been found to be of unusual value in the prompt cure of many cases of thrush. Thrush is usually considered innocuous and a self-limited infection, but such is not the case. It is not uncommonly severe and is occasionally fatal. Its presence in newborn babies indicates gross contamination most probably from dust in hospital rooms and from oral and rectal discharges.

The medical literature of the United States has been unusually silent regarding the vaccination of newborn infants for tuberculosis after the method devised by Calmette and Guerin. In the hands of these investigators the attenuated vaccine BCG has been of great value especially in the prophylaxis of tuberculosis among infants born of tuberculous mothers or those living in a tuberculous milieu. They have found it absolutely innocuous,[45] and unlike other investigators have been unable to isolate strains of the organisms that would produce progressive tuberculosis lesions. Other investigators are not so enthusiastic about the efficacy of the Calmette method as the sponsors. The opinion seems to be that the vaccine is of prophylactic value but that the protection provided is weak and that the claims for it have been grossly overestimated. (Neufeld,[46] Petroff and Branch.[47]) Oral administration is not so protective as parenteral administration, especially intradermal inoculations. (Kereszturi, Park and Schick.[48]) There have been numerous reports of the occurrence of tuberculosis following the use of the vaccine and at Lübeck 75 out of 100 infants vaccinated developed adenitis and died. Whether or not the vaccines were improperly prepared or administered this tragedy is of sufficient seriousness to invite caution among American investigators because of the inclination of the people of this country to institute damage suits upon the slightest provocation. Sasano and Medlar[49] observe that in spite of the claims of the innocuousness of the attenuated tubercle bacillus of Calmette and Guerin all control over it is relinquished when it is injected into the tissues. Investigations so far tend to prove that the virus is not a fixed one and that its stability depends upon its environment. It must be remembered, furthermore, that an attenuated organism is not particularly essential to the production of good prophylactic immunity as has been demonstrated with the vaccines for plague and typhoid fever. In view of the possible danger of BCG vaccine if not properly prepared and its only moderate protective value when administered, its universal adoption for prophylaxis of tuberculosis does not seem warranted at the present time.

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American Academy of Pediatrics

Proceedings

SECOND ANNUAL MEETING OF THE AMERICAN ACADEMY OF PEDIATRICS

SATURDAY MORNING SESSION

May 14, 1932

The Second Annual Meeting of the American Academy of Pediatrics was called to order at 10 A.M. at the New Orleans Country Club, New Orleans, Louisiana, by the President, John L. Morse, M.D., Boston, Massachusetts.

President's Address. (Published in this issue, p. 1.)

Report of the Executive Board Adopted at the Meeting in New Orleans

Samuel McC. Hamill, M.D.

The following applications for membership were approved:

Region I

Dr. Martha M. Eliot, New Haven, Connecticut
Dr. James Harold Root, Waterbury, Connecticut
Dr. Edward Lewis, Washington, D. C.
Dr. Charles S. Lipsitt, New Bedford, Massachusetts
Dr. Miner C. Hill, New York City, New York
Dr. Frederick H. Meichner, Long Island City, New York

Region II

Dr. Luther William Holloway, Jacksonville, Florida
Dr. Edwin August Socola, New Orleans, Louisiana

Region III

Dr. Sterling H. Ashmun, Dayton, Ohio
Dr. Eleanor I. Leslie, Evanston, Illinois
Dr. Samuel J. Levin, Detroit, Michigan
Dr. Bengt. Leopold Knutsson Hamilton, Chicago, Illinois
Dr. Isador Michael Levin, Chicago, Illinois
Dr. Louis S. Robins, Chicago, Illinois
Dr. William Donald Harris, Wichita, Kansas
Dr. Eugene P. Sisson, Lawrence, Kansas
Dr. Frederick Henry Maurer, Peoria, Illinois
Dr. James Dunn, Davenport, Iowa

Region IV

Dr. Angus B. Cowan, Fresno, California
Dr. M. Lee Cohn, San Francisco, California
Dr. Lloyd E. Hardgrave, San Francisco, California
Dr. Louis M. Earle, Hollywood, California

Dr. Egbert Earl Moody, Los Angeles, California
Dr. Victor E. Stork, Los Angeles, California
Dr. Guy S. Bliss, Long Beach, California
Dr. Harmon Tremaine, Boise, Idaho
Dr. Edwin R. Murphy, Salt Lake City, Utah
Dr. Herbert E. Coe, Seattle, Washington
Dr. Harold K. Faber, San Francisco, California

Region V

Dr. Alan Brown, Toronto, Ontario, Canada
Dr. John R. Ross, Toronto, Ontario, Canada

The secretary was authorized to accept the application of Dr. T. G. H. Drake when submitted in proper form.

The secretary presented the resignation of Dr. William Palmer Lucas as chairman of Region IV, which was accepted.

Dr. J. I. Durand of Seattle, Washington, was appointed to fill the unexpired term caused by the resignation of Dr. Lucas as chairman of Region IV.

The report of the treasurer was accepted as read.

It was voted that the treasurer be directed to refund half the annual dues of members approved by the Board at its meeting held in November, 1931.

This group of members was elected in the middle of the year. There has been a natural protest on their part relative to remitting the full dues.

It was voted that the initiation fee be reduced to forty dollars, to be applicable from the annual meeting in June, 1931, to the annual meeting in 1933.

It was voted that the annual dues for the present year be fifteen dollars, including the Journal.

Dr. Clifford G. Grulee of Chicago was appointed secretary-treasurer for the ensuing year.

The resignation of Dr. Walter R. Ramsey, as chairman of the Committee on Nursing Education in Pediatrics, was accepted.

The resignation of Dr. Henry J. Gerstenberger, as chairman of the Committee on Hospitals and Dispensaries, was accepted.

It was voted that the title of the Committee on Relation of Academy to Philanthropic Agencies, Welfare Workers, etc., be changed to Relation of Academy to Public Health Agencies, Philanthropic Agencies, Welfare Workers, etc.

The Executive Board recommends to the Academy that a committee be appointed, with power to act, for the purpose of reviewing the Standard Nomenclature of Disease, and if in the judgment of the committee it be deserving of approval, such approval be granted.

The Academy has been requested to approve the nomenclature as prepared by the National Committee on Nomenclature which has worked for a number of years. It was the feeling of the Board until the nomenclature could be carefully studied we were not in position to give our endorsement. Therefore, the Board recommends that a committee be appointed to study and be given authority to approve, if in their opinion the nomenclature is sufficient.

It was voted that the president appoint a committee of three from the American Academy of Pediatrics to cooperate with the Section on Diseases of Children of the American Medical Association and the American Pediatric Society relative to the Third International Pediatric Congress to be held in London, in July, 1933.

It was voted that the secretary be authorized to spend ninety-five dollars for 500 copies of the White House Conference Report on Hospitals, for distribution to the members.

It was voted to discontinue the Committee on Publications.

The following are recommended for associate membership:

H. C. Sherman, New York City, New York
Richard Scammon, Minneapolis, Minnesota
A. J. Carlson, Chicago, Illinois
T. Wingate Todd, Cleveland
LaFayette B. Mendel, New Haven, Connecticut
Glen Cullen, Cincinnati, Ohio
S. J. Crumbine, New York City, New York
Henry F. Vaughan, Detroit, Michigan
T. J. Kelly, Chicago, Illinois
Guy S. Millberry, San Francisco, California
Arthur I. Kendall, Chicago, Illinois

Report adopted.

Report of the Treasurer

Statement of Receipts and Disbursements

June 1, 1931 to April 30, 1932

Receipts

Balance, June 1, 1931		$13,804.41
Initiation Fees	$ 6,320.00	
Dues	7,730.00	
Interest Bank Account	65.29	
Refunds	192.30	14,307.59
		$28,112.00

Disbursements

Salaries		
Secretary	$ 4,400.00	
Stenographer	1,200.00	
Traveling Expense	1,415.50	
Annual Meeting	203.20	
Postage	197.75	
Printing and Stationery	438.19	
Office Supplies	113.29	
Office Expense	95.37	
Mimeographing	55.45	
Telephone and Telegrams	16.07	
Miscellaneous	84.85	
Transferred to Savings Account	10,000.00	$18,219.67
Balance, April 30, 1932		9,892.33
		$28,112.00

Balance, April 30, 1932	$ 9,892.33	
Savings Account	10,000.00	
Interest on Savings Account	75.00	
Total Cash		$19,967.33

CLIFFORD G. GRULEE, Treasurer.

Report accepted.

Dr. Grulee.—I should like to add that these books have been audited and approved by the auditor.

Report of the Secretary

Clifford G. Grulee

It is a matter of some satisfaction to us all that the American Academy of Pediatrics has been able to carry on without interruption in these troublous times. In no place have we had to curtail our work although in several places we have been able to reduce our expenses. In several ways, as you will find out from the reports of the various committees, our society has made due progress in the past year. It has unquestionably had great influence in medical education, resulting in a very definite increase in many instances of the quantity of work assigned to pediatrics. Another indirect influence has been the appointment of Dr. A. Graeme Mitchell on the National Board of Medical Examiners.

We have now, committees appointed in every state in which we have members and we are fast accumulating information regarding our members as shown in the blanks which have been sent to you. This information will be given to the state committees when they so desire and may be used by the special committees and Executive Board for their various activities.

Most of the regions have shown very definite activity during the past year. The activities of Region III have probably been greatest, but Region I and Region II have shown very active interest. Region IV, following the secretary's visit last fall, has taken some very definite steps toward organization. Region V up to the present time, has had but one member, but during the coming year we have every reason to expect further advance in Canada, since some of the leading men there are beginning to take an active interest.

Committees function largely because of the activity of the chairmen. This will prove true of our committees, especially of our state committees. In the western part of the country and especially on the Pacific coast, the state committees have been very active and are doing a real piece of work. More and more the Academy is being appealed to as an organization to furnish expert opinion for the various conferences that are being held as an outgrowth of the White House Conference.

One of the outstanding things that has been arranged during the past year is for the publication of a new journal under the direction of the Academy. This is a much needed addition not only for the Academy, but for pediatrics throughout the country.

It seems to the secretary that it would be wise to appoint a Committee on Public Health since much of our activity must depend on its usefulness and our cooperation with health department officials.

During the past year, the secretary made a trip to the west going by way of Denver and Salt Lake City, returning by way of Houston and New Orleans at which latter city he was present at the meeting of the Southern Medical Association. There is an active group of influential pediatricians in each of the main centers which the secretary visited. In every instance he was impressed with the sincerity and enthusiasm of these groups. In one or two instances his presence probably was responsible for the formation of a local pediatric society. Distance is a great handicap to the members of Region IV, especially with respect to the association with the rest of the country. It is, therefore, of the greatest importance that they are arranging a regional committee meeting for this fall. A trip to Vancouver convinced me that the men there would best be associated with the Pacific coast group rather than with their fellows in eastern Canada. Canadians who have been approached on this subject, felt that the arrangement is a perfectly obvious one.

On March 31 I had the good fortune of being present at the opening meeting of the Tennessee State Pediatric Society. This was not a local affair because

health department officials from Arkansas and Mississippi were present. The organization will not only help pediatrics in Tennessee, but will also, I am sure, assist in public health work as it has been asked to do.

There are now on our rolls 460 members; 2 who have not paid their dues for 1931 and 62 who have not paid their dues for 1932. Of those who have recently sent in their applications 29 have not paid their initiation fee and dues. My impression is that this latter group is composed of men who have been hit hard by the present financial situation. I feel that they should be given more time for this if they will make special arrangements.

Aside from the appointment of the Committee on Public Health, the secretary sees no reason to change the present system of administration. He feels that appointments to committees should be renewed each year and that there should be a very definite tendency on the part of the Executive Board, at the instigation of the president, to remove incompetent members and chairmen of committees. It is only in this way that we can proceed with any hope of success. Our task is so tremendous that it will require the effort of every one to be able to get the results which we desire.

It is my sad duty to report to this society the deaths of two of its members, Dr. John Brown Manning and Dr. Stafford McLean.

Respectfully submitted,

Report accepted.

Obituary to Dr. John Brown Manning

The American Academy of Pediatrics has suffered the loss during the year of one of its members, in the death of John Brown Manning.

Dr. John Brown Manning was born in Boston, Massachusetts, June 3, 1879. He received his preparatory education in Adams Academy in Quincy, Massachusetts, and was graduated from Harvard in 1903 and from Harvard Medical School in 1906. His internship was served in the Worcester City Hospital, Worcester, Mass., and the Children's Hospital in Boston, after which, in 1911, he went abroad to study, visiting clinics in Berlin, Munich and Vienna. He was the author of numerous professional articles on diseases in children and public health as it relates to children.

Dr. Manning was a charter member of the American Academy of Pediatrics and greatly interested in its activities. He was enrolled in the California State Medical Society and the Santa Barbara County Medical Society. His activities as associate of Dr. Edward J. Lamb at the Children's Clinic, and his interest in the County Health Commission occupied much of his time.

Dr. Manning was with the Red Cross for nearly three years, going overseas before this country entered the World War, remaining a year, and returned to Europe again on the entry of the United States into the war. He devoted his overseas activities to looking after the feeding of children in Russia, Siberia and France.

He was a great home man, and possessed of a personality which endeared him to all with whom he came in contact. His club memberships included the University and La Cumbre Country Clubs and a membership which he prized highly, his charter enrollment in the American Academy of Pediatrics.

Dr. Manning, after moving to Santa Barbara from Seattle in 1924 had been active in public health work, as well as in his private practice. He had given untiringly of his time to the Visiting Nurses Association, the Well Baby Clinic and Cottage, St. Francis and County Hospitals. He was a past president of the St.

Francis Hospital Staff and of St. Vincent's Orphanage, and was on the advisory board of the County Welfare Commission.

He is survived by his widow, Mrs. Mary Te Roller Manning, and his two sons.

BE IT RESOLVED, that the American Academy of Pediatrics express to the family of Dr. Manning its sincere sympathy.

Obituary to Dr. Stafford McLean

On March 13, 1932, Stafford McLean, one of the most untiring and devoted workers in the field of pediatrics in New York City, died suddenly at the age of forty-six. His entire professional life had been spent in service to children, and his untimely death leaves a void that cannot easily be filled.

Born in Newbury, New York, educated at Georgetown and Columbia Universities, graduating in medicine from the latter in 1908, Dr. McLean served as the first resident on the pediatric service at Bellevue Hospital under Dr. John Howland. He continued his studies abroad for two years and on his return became associated with the work at the Babies Hospital. To that hospital both in its old and new locations he gave unstintedly to the out-patient department as attending physician, as a member of the board of trustees, and serving likewise as clinical professor of diseases of children for Columbia University.

Dr. McLean was a member of this Academy since its inception, a member of the Society of Alumni of Bellevue Hospital, consulting pediatrician to many hospitals in the New York area and served with distinction in many child welfare activities.

Through his writings he contributed many studies to his chosen specialty. His work on the pathology of the osseous system in congenital syphilis being perhaps the one which best typifies his close application, common sense and clinical experience.

The Academy has suffered a distinct loss in the death of Dr. Stafford McLean because he exemplified to a major degree those qualities of heart and mind which can serve so well in advancing the aims and ideals of such an organization as ours. It is hereby moved that this resolution expressing our sympathy and our sense of loss be spread upon the minutes and that a copy be sent to his widow, Elizabeth Cutting McLean.

Report of Region I

Louis C. Schroeder, New York, Chairman

The present membership of Region I is 143, an increase over last year of 58. The committee has constantly borne in mind the ideas emphasized last year by Dr. Abt that we should not duplicate the work of other organizations, that we should cooperate with our colleagues and those who are in closely allied branches of science pertaining to child life, and that we should aim to discover neglected problems and so far as is in our power, to correct evils and to introduce reforms.

To translate these admonitions into effective everyday working plans, however, is not the work of a moment.

One of the problems which has been the subject of much concern is that of increasing the membership. It is the belief of our committee that so far-reaching and so fundamentally important are the aims of this Academy that every effort should be made to enroll every eligible pediatrician. If the Academy is to be the official spokesman for the children of the United States and Canada it must be more than a voice crying in the wilderness. Unless we number among our members at least 90 per cent of those who can meet its qualifications, it can hardly be asserted that we speak with the voice of authority. Such authority is sadly needed

today. With nutritionists undertaking the feeding of babies, psychologists finding the secret of successful child rearing in Vienna or Berne as the case may be, with babies' nurses handing out to mothers their half-baked opinions as to what ails the infants and with the air and the printed page filled with advice to mothers from lay persons who have gathered all the stuff that has a high-pressure salesman appeal, the need for a voice that has authority is plainly apparent.

In the main three obstacles to increasing our membership have been found. The first is economic, the second a failure to understand our aims and the third from a group of men who are so wrapped up in a special phase of pediatric work that they fail to see or deliberately close their eyes to the fact that no part can be greater than the whole.

To overcome the first obstacles the committee is ready and willing to support any measure which can help in this trying situation, even though it means lowering dues or a method of deferred payments. The last two obstacles can be overcome only by education, backed by the idea that so important is the work of the Academy that any pediatrician should be willing to make a sacrifice to further its aims and ideals.

Another problem which has been pressing forward with increased intensity is how can the total membership be best employed.

Not all of us can be placed on Committees, although all of us can contribute to one or more of the demands made by the various committees. We, in Region I, feel that the special problems are being in the main handled well by our committees. Witness among others the excellent work done by Dr. Veeder on "Medical Education," by Dr. Moore on "School Health and School Health Education" and by Dr. McCulloch on "Our Relation to the Section of the Diseases of Children of the American Medical Association."

It is evident, however, that work of this nature is limited. To interest all members it must be made apparent to them that any movement to make preventive pediatrics the force it should be will be entirely dependent upon the general practitioner. He is the one who in the last analysis must popularize those tried methods of prevention such as vaccination and diphtheria immunization; he is the one in whose hands must be placed all methods of preventing disease; he is the one whose interest must be aroused. Our duty in this matter is very plain. We must try in every conceivable manner to work with all types of social service agencies in order to make their work fully effective. Upon the former we must depend for the administrative end of health problems but upon the general practitioner must be placed the burden of seeing that health measures are carried out.

So different are the problems connected with this viewpoint in the city, the town, and in the rural districts that there is more than enough to occupy the time of all the members. Other problems run all the way from the request of colored physicians in New York City for postgraduate instruction in pediatrics to the requests of physicians in rural districts for help with the problem of childhood tuberculosis.

During the coming year Region I hopes to accomplish something definite about the two main issues here presented and at the same time have a closer check-up if possible on the pediatric curricula in the various states comprising this region and some attempt will be made to gather data on the variations which exist in the quarantine laws affecting the communicable diseases.

Some of our members have been able to serve in furthering the recommendations of the White House Conference as they relate to pediatric service in hospitals. Through the Children's Welfare Federation of New York City the Associated Out-Patient Clinics of Greater New York will soon recommend to all out-patient departments such procedures as look to the registration in the Pediatric Department of *all* cases whether surgical, medical or otherwise—the unification of hos-

pital and out-patient staffs and other desirable features recommended by the White House Conference. This field of opportunity is one in which every member should have at least some part, no matter how small.

Report accepted.

Report of Region II

Alfred A. Walker, Birmingham

Due to the absence of Dr. Royster, Region II has no formal report to submit.

Several new members have been accepted in the last year. One general meeting was held in November in New Orleans during the meeting of the Southern Medical Association at which Dr. Grulee was present. It was recommended that Dr. E. C. Mitchell, of Memphis, be added to the Regional Committee. This was done at a subsequent meeting of the Executive Committee. Several new applications were received and acted upon.

A chairman was appointed on April 6 for each state, and it is hoped that they will stimulate interest in the Academy.

Report accepted.

Report of Region III

C. A. Aldrich, Winnetka, Chairman

The annual meeting of the Regional Committee III was held on May 12, 1932. The points discussed fell into three groups, membership activities, organization suggestions and extra-academic relations.

The regional committee recommended for acceptance to the society 52 men who were approved at the fall meeting of the Executive Board. Applications for 2 men were rejected and for 2 more were held over for further information. Since that time 10 more applications have been approved by the Regional Committee and passed by the Executive Board. Two applications have been rejected and 2 applications are at the present time being held for further consideration. At the present time the membership of Region III including those voted upon favorably last night comprises 201 men.

It is felt that if and when the depression is over this number could be materially increased by the election of decidedly worth-while men and that the proposal of such men is the duty of the membership at large rather than of the Regional Committee in the future.

No clinical meeting has been held in this region for the reason that it was thought unwise to interfere with the Central States Pediatric Society meetings. It is thought that it will be possible to combine our clinical meeting with theirs at some future time.

The newest development under the Regional Committee has been the appointment by Dr. Morse of local committees in each state. Reports of the results of the work of these various groups have been received from states in Region III. Since responsibility for this phase of the work of the Academy is placed upon the Regional Committees and the extent to which the Academy is going to function locally as a vital force in child welfare depends largely upon the success of the state committees, these reports were of great interest to us. As might be expected, they varied greatly in their scope. These included state White House Conference meetings, state departments of health, state departments of public welfare, state boards of control, state and county medical societies, health officers, medical schools, public schools, the press, radio, lay meeting groups, parent teachers associations, and pediatric societies.

It is the feeling of this regional committee that the importance of this cooperative project, touching upon so many outside groups, warrants free discussion. In the past each particular organization or group of people interested in child welfare has gone enthusiastically along its own course studying situations and recommending preventive and curative treatments. Thus pediatrists, psychiatrists, psychologists, educators, nutritionists, nursery school workers, those interested in the study of growth and development, and public health officers, not to mention the less well defined groups which might be included under the head of child study classes, have all gone their separate ways. The inevitable result of these multiple movements has been that while they all have a common goal, child health, the methods of attaining this result come into conflict at many places, thus giving rise to misunderstandings. It seems to this committee that one of the greatest opportunities presented to the American Academy of Pediatrics is the project of unifying these various progressive activities into a rational, scientific, purposeful movement. This purpose can be furthered by the general standing committees of the Academy and by the local state committees, but most of all by the attitude of each member in our ranks. We must be ready not only to teach these groups what we have learned on the subject of child health, but also to learn what they have to give us along their particular lines. At the Washington meeting of the White House Conference, the first nation-wide attempt at cooperative effort was felt.

Report accepted.

Special report of the Committee of the State of Iowa was read (see p. 136).

Dr. Aldrich.—I think it is the feeling of this Regional Committee that the importance of this cooperative project, touching as it does so many outside groups, warrants free discussion at this time. The activity of such state committee is of more value than anything I could say about what ought to be done.

President Morse.—Dr. Aldrich's report shows what can be done by a state society.

Secretary Grulee.—I understand Dr. McCulloch will publish that report.

President Morse.—I think it is of the greatest interest to every state committee and every member of the Academy.

Dr. Hamilton.—Perhaps the answer to what I am about to say has already been given in the President's address, or in that which will be said later. But in some parts of the Middle West conditions differ a bit from either the far West or far East. Instead of depending on a few patients and rather liberal fees, we depend more largely on a volume of patients and smaller fees. In relation to that, the matter of Parent Teachers Association and pre-school clinics has become more or less of a problem. By direction of the Nebraska State Pediatric Society, I am saying we are hoping that something will come out of the Academy of Pediatrics that will give us some guidance as to what has and is being done in other communities.

In some of our neighboring communities, where we have talked to some of the men, they say they have refused to engage in pre-school examinations for people who are able to pay, perhaps their own patients, for no remuneration. They have stood fast and firm on that position. We are rather anxious to know the policy of the Academy of Pediatrics in those matters, hoping as time goes on we will get some enlightenment on that subject. However, I am sure those who have under consideration that part should realize that conditions differ in different parts of the country. Having that in mind might be of some help in directing the policies.

Report of Region IV

Jay I. Durand, Seattle, Chairman

I am very much in the same position as Dr. Walker. Having become the regional chairman about twelve o'clock last night, I have not been able to accumulate data or make much of a report. We have increased our membership on the Pacific Coast by about eleven or twelve members since the last meeting. Already the work which has been outlined as being the objective of the Academy has been taken up by the Northwest Pediatric Society in very much the way we hope to have the Academy take it up. Since six of the members of this Northwest group are very largely the guiding members of the society and are members of the Academy, I feel the Academy has had its part in the attitude which the Northwest Pediatric Society has taken.

We have held in Washington a state White House Follow-Up Conference in which the Committee on Medical Affairs has been headed by two of our members. In California, and especially Los Angeles, with Dr. Reiss, chairman, and Dr. Scott, as secretary, our members are active.

This committee of the Academy acts in an advisory capacity to the county health department, advising with them relative to the welfare of the children.

We have had in Seattle the problem which the doctor from Nebraska just referred to. We have rather changed our attitude from a former one, which was very much like that of Nebraska. For the last several years the local pediatric society has manned all the city health clinics and we succeeded in getting paid for it. We have manned the preschool clinics but have arranged so that blanks can be furnished to the doctors of the community, and any doctor can make his examination and his examination will be accepted.

I think it is time we did something for the pediatrician as well as for the child. I believe if we show an interest in our cooperation with the welfare organizations, and especially with the public health associations, we are going to take over more and more of this work of immunization, of assisting with school health work and will succeed in having our members receive compensation for it. I think we will benefit distinctly by it.

As far as the preschool examination is concerned, we have found that it increased the work of the private pediatrician because for every preschool examination made, many patients visit their offices who would not otherwise have found their way there.

Dr. Reiss.—I think a few words of elaboration, in regard to what Southern California is doing in Region IV might, in a measure, answer Dr. Hamilton's question. We have interested ourselves in public health work and particularly in such phases as seem to encroach on private practice. After numerous conferences with the Los Angeles county health department, five members of the Academy were invited to act as an advisory committee to the department, in which capacity the committee will be enabled to exert great influence in shaping public health policies. It is the hope of this committee to be permitted to act in a similar advisory capacity to all other public health agencies that deal with child welfare problems, thus helping to place pediatricians in their rightful position of leadership. I feel hopeful that when we meet again next year, Region IV, as well as other regions, will bring to this body reports of great progress in this direction.

President Morse.—I don't know that the Chair should make any remarks without calling on the vice-president to take his place, but I am going to a meeting in Boston next week to consider the question of this preschool examination in a small town in Massachusetts. The laity there asked for some such thing. We are going

to meet with them and the state board of health to try to thresh it out and get at the best way of interesting the local physicians in such a scheme so that they can take part in it and be paid for the examination of the patients who are able to pay.

Secretary Grulee.—I happened to meet Dr. Cary, the outgoing president of the American Medical Association the other morning, who said he had begun to fully realize the approach to the public was through the pediatricians, that he felt that was the way out of our difficulties with the public in general and that he hoped the pediatricians would be the means for bringing about better understanding between the public and the medical profession.

Report accepted.

Report of Region V

Clifford G. Grulee, Evanston

Secretary Grulee.—Dr. Tisdall was unable to remain and has asked me to say he was about to take up the matter further with his colleagues in Canada at the meeting of the Canadian Pediatric Society which is to be held in June. He feels rather encouraged in the belief that the movement will take a further impetus in that region.

Report accepted.

Reports of Special Committees

Committee on Medical Education

Borden S. Veeder, St. Louis, Chairman

This report will be published in detail in a later issue of the Journal.

It has been brought to the attention of the Committee on Medical Education that the subject of pediatrics has been given the status of a nonessential clinical specialty by the National Board of Medical Examiners.

The committee offers the following resolution and moves its adoption:

BE IT RESOLVED, that the National Board of Medical Examiners be urged to give to pediatrics the status of a major, compulsory subject of similar rank to that of medicine, surgery and obstetrics.

The general question of certification was referred to in the report of the committee a year ago. Dr. Helmholz of the committee has made a study of the methods used by other groups such as ophthalmology, surgery, and obstetrics, to certify qualified men who limit their practice to these fields. The committee has recommended to the Executive Committee that the matter of an examining board to certify pediatricians be studied; and this matter has been referred back by the Executive Committee to this committee. We do not feel we are prepared, at the present time, to discuss this whole matter with you. We wish to make some additional studies, and we propose to go into it thoroughly during the coming year and render a tentative report to be published before the next annual meeting so that a full and intelligent discussion may take place at that time. That is provided it is the wish of the Academy. We put it up to the Executive Committee, as we were not sure it was our function. We feel there will be pressure brought to bear within the next year or two through the American Medical Association and the examining groups who have been considering this matter to do something with regard to certification of pediatricians.

Whether or not pediatricians should be certified is not clear in our minds. We think it is a thing that must be thoroughly discussed by the Academy. We have decided to ask the Academy for instructions as to whether or not you wish us to do this.

President Morse.—We will have Dr. Veeder continue with the report on the journal and discuss the report of the committee later.

Dr. Veeder.—This was supposed to come after the report of the Publication Committee. Dr. Grulee asked me to say something about the new Journal. In his report for the Committee on Publications, he will undoubtedly give you some of the reasons why it was established.

When the meeting of the Executive Committee was held last fall, it was finally decided to establish the Journal and Dr. McCulloch and I were persuaded to take over the editorial task. Before going into it, a thorough investigation was made of the needs and possibilities for such a journal. Of the men consulted throughout different parts of the country, over three quarters were in favor of establishing the Journal. We realized that it was a bad time financially but the publisher was willing to assume the full financial responsibility if we would take it over, edit it, and run it as the official journal of the Academy.

As you heard this morning, the subscription to the Journal will be included in the dues of the members. It will automatically go to all members. The publishers were not supposed to solicit or try to obtain subscriptions from any members of the Academy. A complete list of members was given them and was sent to their detail men. It has come to my attention that a number of the men have already subscribed to the Journal, who are members of the Academy. They should notify the publishers that they are members of the Academy and, if they have paid any money, should ask for its return. No member of the Academy was to be asked to subscribe.

We shall start publication the early part or the middle of July, as soon as we can get it out. It is rather difficult to get the first number started. Approximately 500 subscriptions will come through the Academy. The C. V. Mosby Company has already obtained 700 subscriptions outside, so it would seem we would start with a subscription list of about 1,500, which we are told is unusual for a journal which has not yet appeared.

Subsequent to Dr. McCulloch and myself accepting the editorship, an editorial board has been appointed which was officially acted upon last night at the executive committee meeting. The members of the editorial board, in addition to Dr. McCulloch and myself, are Dr. Blackfan of Boston, Dr. Faber of San Francisco, Dr. Strong of New Orleans, Dr. Van Ingen of New York, Dr. Cooley of Detroit, and Dr. Grulee ex-officio of Chicago. The make-up of the editorial board takes in all the sections of the country, and includes men not only active in the teaching and university field but active also in the clinical practice of pediatrics. We will expect to treat pediatrics from a broad standpoint. The journal will consist of about 130 pages each month, and if the material is available we can go up to 160 pages.

The "Original Communications," or first section, will contain clinical articles, articles of clinical scientific investigation, communications bearing on the relation of public health to pediatrics, and medicosocial articles. In other words, we expect to treat pediatrics from the broadest viewpoint.

We are not duplicating the work of the *American Journal of Diseases of Children*. Let me say that the new journal is in no sense in competition with the *American Journal of Diseases of Children*. It was not started in that way and we hope will never develop into such a situation. There has been the heartiest cooperation and backing of the men in charge of the *American Journal of Diseases of Children*. We will not develop an abstract department such as they have so splendidly developed, but will develop critical reviews of some one or more subjects each month. In addition to that, we intend to publish quite elaborate news, one might say, of the pediatric world.

Each state chairman of the Academy will be made a correspondent so that we will be able to get fresh information of what is going on in each state. In this way what is being done at any time in California will be available to the men in Massachusetts, for example, and the outstanding work they are doing in Massachusetts will be available to the men in other states.

In addition, we have secured a group of foreign correspondents who will, we hope, discuss the news going on in the world of pediatrics and give us first-hand information of important papers and trends.

Another section will be devoted to Academy news that will take in such things as the reports which are presented here today, transactions of the meetings, round tables, etc. There will be book reviews and finally some columns of "Comments" which we hope to make attractive. In this we would like to have your opinion, feeling and criticism, rather an open forum, so to speak, in regard to pediatrics.

I have this much to say further. Whether this journal will be a success is going to depend on the men in the Academy. We are the editors and are not writing the Journal. If it fills a need, it will go on. If it does not fill a need and the men are not interested in it, I hope it will die a quiet, peaceful death without simply continuing as another journal. That is the one thing we do not want. It will depend for its success entirely upon the support given it by members of the Academy.

Report of the journal accepted.

President Morse.—The next thing, it seems to me, is to consider the resolution of the committee.

Dr. Wall.—The question as to whether pediatrics amounts to something in the minds of the National Board is going to depend on whether we will convince them of that. The mere adoption of the report will not be effective, but some of the members may be reached and convinced of the necessity. I believe if we provide them with a copy of the report just presented by Dr. Veeder we can do a great deal of missionary work.

Dr. A. Graeme Mitchell.—I think the National Board would be glad to have an expression of opinion from this particular group. I believe what Dr. Wall said is true. All the pressure brought to bear would be helpful. The situation is quite incorrect. If my interpretation is correct, it is not necessary for any Examining Committee of the National Board to give any questions on pediatrics. I think you can rest assured that as your representative I have spoken rather plainly about the matter of the National Board meeting.

Dr. Samuel McC. Hamill.—I should like to say that copies of the report presented by Dr. Veeder's Committee on Education were sent to every member of the National Board with an accompanying letter. I had replies from practically all the members, expressing appreciation and recognition of the necessity for giving pediatrics a different position in the examinations of the National Board. I rather gather, if Dr. Mitchell will permit me to say so, from correspondence with him, that the National Board is very definitely receptive, and they really want to have the opinion of organized pediatricians as to the status this particular subject should hold in the national examinations.

Resolution adopted.

President Morse.—The next matter is the question of whether the society wishes to refer to this committee, for further investigation, the question of certification of pediatrists.

Dr. S. McC. Hamill.—I move the matter be referred to them for further consideration.

Carried.

President Morse.—The next question is in regard to what you wish to do with the report of the Committee on Medical Education.

Adopted.

Dr. A. C. Silverman (Syracuse, N. Y.).—No reference has been made at this time to the report of the Committee on Educational Policies of the Association of American Medical Colleges. (Jour. Assoc. Am. Med. Coll. 7: 42 [Jan.], 1932.) That committee has recommended certain basic requirements for the preparation for practice in any of the specialties. One point which has not been mentioned here is the partial substitution of an assistantship or graduate work in the fundamental sciences in the preparation of the pediatrician. One can agree fully with the president's emphasis on the necessity for more clinical training but one should not lose sight, nevertheless, of the value of additional training in such basic subjects as physiology or pathology or chemistry.

President Morse.—I think probably it was rather assumed that graduates of the Class A school would have received that instruction in the fundamental sciences.

Dr. Silverman.—I referred to additional work.

The question was called for and the motion carried.

President Morse.—I believe there is no report from the Committee on Hospitals and Dispensaries.

Report of the Committee on Relation to Section on the Diseases of Children of the American Medical Association

Hugh McCulloch, St. Louis, Chairman

The committee has only a brief report that it has made progress during the past year. The committee's name should be changed to conform to the new title of the Section on Pediatrics of the American Medical Association. That has finally been accomplished. The committee has been changed in personnel by the addition of Dr. Hill and Dr. Neff.

Two matters in the mind of the committee have been expressed before. One is the annual meeting of the Academy at the time of the A. M. A. It seems desirable this should be continued either before or after the Section meetings. There is such an interlocking of membership between the Section and the Academy that really the Section might be looked upon as a scientific assembly of the American Academy of Pediatrics. This arrangement seems very desirable to be continued.

The second matter which has been in the mind of the committee and which was referred to by Dr. Veeder in his report relative to the publication of the Journal, was that the Journal of the Academy should work harmoniously and complimentary to the *American Journal of Diseases of Children*, which is the official organ of the Section, and that the two journals should continue to function as in the past.

Report accepted.

Dr. S. McC. Hamill in the chair.

Report of the Committee on Relation to the White House Conference

A. Graeme Mitchell, Cincinnati, Chairman

Dr. Mitchell.—I have not been able to see all the members of this committee since the report of the Executive Committee. I am sure, if I could, one of the recommendations of this committee would be that the Executive Board be severely censored for not paying more attention to the resignation of the chairman of this committee.

The following is the report of the committee.

Your committee has kept in close touch with the White House Conference Follow-Up Committee. The Academy Committee has found little to do this past year, and its inactivity can be explained on this basis.

At this meeting of the Academy, however, your committee presents rather an important and significant recommendation. It has been suggested by the Follow-Up Committee of the White House Conference that the state committees of the American Academy of Pediatrics attempt to bring about, through the medium of State White House Conference committees, a coordination of the work of the state, county, and other local medical societies and the state department of health, so there may be application of the principles of preventive medicine as recommended by the White House Conference and that facilities may be made available and accessible to all physicians of the state in a way which will allow them, in their practice, to apply to each child the proper preventive measures.

The committee requests that it be given authority to proceed with a further study of this matter and to work out with the Executive Board of the Academy the details of its application and its adoption, if this be found feasible.

Report accepted.

Report of the Committee on Publications*

Clifford G. Grulee, Evanston, Chairman

Committee on Publications has considered several phases of the situation and would report as follows:

1. Publication of the transactions of the American Academy of Pediatrics—Question must be raised as to whether the transactions (a) shall be published at all and (b) if published, should they be published in complete or abstract form. Publication of the transactions in complete form would cost between fifteen hundred and two thousand dollars at the minimum; in abstract form these could be published at a much lower figure probably not to exceed five hundred dollars. Your committee would recommend that these transactions be published in abstract form.

2. The advisability of publishing a special journal—a survey of the situation as to pediatric journals in this country and Canada shows that there are two purely pediatric journals published, namely, the *American Journal of Diseases of Children* and the *Archives of Pediatrics*. The *American Journal of Diseases of Children* is in size about 235 to 260 pages an issue, and the *Archives of Pediatrics* in the neighborhood of 65 to 100 pages. These two journals contain most of the pediatric articles published in this country and Canada. In each of them there is occasionally a sprinkling of articles from abroad. If we are to compare these journals with the journals in Europe, we find that there are six German journals. However, the two most important of these together are probably not as large as is the *American Journal of Diseases of Children*. The other three are comparatively unimportant journals. We must remember that the German journals not only draw from Germany, but also from Austria, Hungary, Russia, Czecho-Slovakia and the Balkan States, so that the population from which they obtain their material is much greater than that from which our journals obtain theirs. France has four pediatric journals and Italy five. These are mostly, however, smaller than those published in this country and many of them show the effects of competition. The cost of publishing a special journal is greater than most people realize. For instance, the approximate annual cost of the publication of the *American Journal of Diseases of Children* is $37,000; this without all overhead expenses included. For the American Academy of Pediatrics to undertake the publication of such a journal

*Report given at First Annual Meeting, June 12 and 13, 1931, Atlantic City, New Jersey.

at this time, would to us not seem advisable. There is some question as to the need of such a journal. There has been some agitation for the publication of a journal of purely scientific nature. Such a journal would have very small circulation; and therefore, would not command great popularity with authors.

3. There comes next the advisability of publishing public health pamphlets which would be sanctioned by the society. At the present time, some other organizations are better fitted for such.

4. Shall the American Academy of Pediatrics subsidize the publication of special articles?

At the present time, there is almost no sale for monographs in the United States. Nothing probably is more needed in American literature than such monographs. If they are published in or with an existing journal they will have much more widespread notice and use than if published separately. The difficulty, of course, is one of cost. Journals cannot usually assume this extra burden which would mean anything from one to two thousand dollars per monograph.

This Academy might help the publication of such special articles and monographs in two ways: first, by sanctioning the procedure and putting its stamp of approval upon a given article; second, by subsidizing the journal in which the article is to appear. It is possible from time to time to obtain such funds from special organizations, so that it might not be necessary for this society at the present time to do more than put its stamp of approval upon such an enterprise. We would recommend that the society at least give its approval to the effort.

5. It is conceivable that the society might distribute reprints of certain outstanding articles by arrangement with the authors at the time of publication. This would have to receive further consideration before your committee would feel willing to advocate it.

6. It would seem possible that something in the form of a news bulletin could be published monthly by this society. This could be produced at small cost if mimeographed; about ten cents per person per issue, or even less. It might contain each month, the report of the progress made by one of the committees. It could report any action taken by the Executive Board and contain a supplementary list of new members. It would be very easy to get out such a bulletin and the Committee on Publications would recommend that such be published.

Respectfully submitted,

Report of the Committee on Publications (May 14, 1932)

Clifford G. Grulee, M.D.

The work of the Committee on Publications during the past year has been taken up very largely with arrangements for publication of a journal which would be sponsored by the society. After several conferences, the committee made arrangements with The C. V. Mosby Company, of St. Louis, to put out such a journal which would be under the direct control of the Editorial Board appointed from the society. The Executive Board was able to persuade Dr. Borden S. Veeder and Dr. Hugh McCulloch to act as co-editors of this Editorial Board and there is every reason to expect that the first publication of this journal will take place in July of this year.

This journal will be available to the membership of the Academy at the rate of five dollars per year; to others at eight dollars and fifty cents. It is hoped that news notes from the Secretary's office will be published each month in this journal to call to the notice of the members what is being done throughout the country.

Likewise we hope to be able to publish in this a complete roster of the membership, to which the names of new members will be added from time to time.

In another place will be taken up the question of the subscription for this journal and its relation to the membership of this society. The Executive Board saw fit to accede to the request of The C. V. Mosby Company that the society interest itself to the extent of two thousand dollars in payment for four hundred subscriptions to the journal.

No further projects have been considered by the Committee for Publication.

Report accepted.

Report of the Committee on Relation of the Academy to Philanthropic Agencies, Welfare Workers, etc.

J. Victor Greenebaum, Cincinnati

Dr. Greenebaum.—In the absence of the Chairman, Dr. Huenekens, and without specific instructions as to how to proceed, I think it would be well to announce that the Committee on Relation to Philanthropic Agencies, Welfare Workers, etc., had a meeting at Dr. Grulee's home Sunday, February 21, at which the following statements were agreed upon. These statements were sent to the executive board, corrected, commented on until they finally reached their present shape. Within the past few weeks every member of the Academy received the statements so that each would have a chance to vote intelligently on these important reports. The first of these reports concerns the Jones-Bankhead bills (Bill S-572 and H. R. 7525), the second is a statement of the principles which will govern the activities of the American Academy of Pediatrics in its relation to all agencies which have to do with the welfare of the child.

This report consists of two parts. First, a recommendation regarding the attitude of the Academy toward the Jones-Bankhead Bills. The second, a Declaration of Principles for Guidance in Contact with Health Departments, Child Welfare Organizations, etc. It is as follows:

PART I

The Committee on Relation of the Academy of Pediatrics to Philanthropic Agencies, Welfare Workers, etc., has studied the Jones-Bankhead bills (Bill S.-572 and H.R.-7525) (based on the extension of Sheppard-Towner Acts) from the point of view of the benefits to be derived from that bill by the mothers and children of our rural and smaller urban communities, and submits the following points for your consideration:

While we recognize that there are certain outstanding objections to the bills, notably the interference of the Federal Government in State affairs; the proposed administration of the Acts largely by nonmedical persons; and the limitation of the work to rural communities, although supported by general taxation, we feel that the educational advantages of such a program, as is proposed, would be sufficient to offset these objections.

Moreover, there can be no denial of the fact that in many states there is inadequate provision for proper maternal, or child care in rural communities, at the present time. In the main, the reasons for this are two:

1. In many instances the physician has not had proper training in preventive obstetrics and pediatrics.

2. In numerous rural communities the number of physicians is inadequate to meet the need.

In the event of the passage of this bill, the aim of the program should be twofold:

1. To educate the public as to what constitutes proper maternal and child care; to demand that type of service from their physicians.

2. To stimulate the training of physicians in this type of work and to demand that medical schools give more consideration to the training of physicians in preventive obstetrics and preventive pediatrics.

Inasmuch as this should be a program purely for educational and demonstration purposes, we feel strongly that it should be limited in time to a period of not less than five nor more than ten years and the failure to provide some such termination constitutes the chief objection which the Committee finds to this bill. Provided such a time limit is set and that this be understood as an educational and demonstration program, the Committee would recommend that the bill be endorsed by the Society at large.

PART II

It should be remembered that one of the cardinal principles which is governing the activities of the American Academy of Pediatrics is cooperation with all agencies which have to do with the welfare of the child. Bearing this in mind, we feel that the following statement of principles is justified and is not to be interpreted as antagonistic to any existing organization, but only as helping to define conditions under which the Academy can carry on cooperative measures with them.

The committee believes that it is not the essential function of governmental agencies, such as health departments, to give medical care to children. We feel, however, that it is justifiable for a health department to give this care if physicians will not do so. We, therefore, consider that it is the function of this society to stimulate in every way possible the interest of the medical profession in the individual care of the child from the preventive as well as the curative standpoint. As an example of one phase of preventive medicine; namely, the prevention of contagious diseases, in which private physicians and a department of health have cooperated to produce the most effective results, we cite the plan which has been elaborated by Dr. H. F. Vaughan and Dr. L. O. Geib of Detroit, and published in the *Journal of the American Medical Association*, **97**: 366, August, 1931.

We feel that the same principle applies to private health agencies and school examinations, but modifications of these ideas are often necessitated because of the present attitude of indifference on the part of a large proportion of the medical profession. We decry the tendency of certain organizations toward paternalism with respect to medical affairs and are decidedly opposed to rendering free service to patients who can afford to pay; and in arriving at these conclusions, our objective has been the protection of the health of the child.

It has been shown by reports of health departments, notably that from Detroit, that the child's health is much better promoted with the cooperation of the medical profession than without such teamwork.

It is to be recognized that a combination of a united medical profession, maintained at a high level, and broad-gauged public health agencies, is of paramount importance in promoting the health of the community.

Dr. Moore (Iowa).—In accepting this report, does it mean that we approve of the passage of this bill?

Chairman S. McC. Hamill.—I would interpret it just as I interpreted the motion to approve the report of the Committee on Relation to the White House Conference; namely, that the approval of the report authorized that committee to proceed with the plan it has under consideration, so I would rule it does mean approval of that bill.

Dr. Moore.—Then I should like to ask another question. Does this bill carry a federal appropriation? I presume it does, inasmuch as the limit of ten years is suggested.

Dr. Greenebaum.—It does.

Dr. Moore.—If it carries a federal appropriation, I am not in favor of it. If it does not this will do no harm. If it carries a federal appropriation the funds will probably be used largely by public health agencies and similar organizations with health programs. According to the statements made here, regarding the attitude of physicians, I presume the money will be used by laymen to educate physicians to meet their own civic and professional responsibilities. Personally, I am not in favor of educating our physicians in that manner.

If this bill passes I hope very much we won't get any of this money into Iowa. I think it would be a distinct hindrance in having the medical profession as a whole back of a program of this character. I believe we should educate our medical profession from within. If this organization cannot wield enough influence to start such education we are in poor position. Should we have to call for federal appropriation and assistance of the laymen to educate our profession?

Dr. Scott.—Is this bill not a continuation of the Sheppard Towner Bill?

Chairman Hamill.—Approximately.

Dr. Scott.—According to that, the federal funds must be matched by state funds. Would the laymen have any control over these funds? Is it not entirely under the control of the state health departments?

Dr. Greenebaum.—The state health department only for the rural cities and cities under fifty thousand.

Dr. Wall.—I am quite sure the committee must be familiar with the gentleman's agreement regarding the old Sheppard Towner Bill, when they speak of a limit to the action of this bill. There was such a gentleman's agreement on Capitol Hill as to the limit of the Sheppard Towner Bill. Notwithstanding, it was repeatedly violated and attempts were made and made successfully I think, for years to continue the action of the Sheppard Towner Act. This whole subject is a highly controversial one, and I am sure the members of this Academy as well as the Section on Diseases of Children of the American Medical Association entertain different opinions.

This is not a measure being put forth by the medical men, but largely is a measure sponsored by the League of Women Voters to keep a department in Washington, namely, the Children's Bureau, functioning at a high rate of expense. I believe all of us should be aware of that before we vote on this proposition.

Dr. Moore.—I want to emphasize the same thing Dr. Wall brought out. There was to be a limit to the Sheppard Towner Bill. It was extended and finally disappeared, and now another measure is proposed with a five-year or ten-year limit—a continuation under another name.

Dr. Young (Dallas, Texas).—I think the medical profession as a whole has taken a very decided stand against the Sheppard Towner Bill. I think that should be generally realized. As a medical society composed of men who are also members of the American Medical Association, I don't believe we should, at this time, or in the future, take any diametrically different opinion. The paternal attitude of government entering into the health work of our children, and especially the lay organizations, should stop. As the committee chairman stated, this is primarily an educational matter, and if we cannot educate the members of our own profession in the educational centers and postgraduate institutions, we should determine some better method.

This five- to ten-year limit will be and has been stretched. It is hard, after a group of people have become dependent upon a bureau established by the government to wield power to give up that power. The employees of the bureau will continue to foster that bureau because it is their livelihood, and will use every means possible to continue to keep it functioning at a high rate of speed. They will substitute a further bill if this one dies out.

Secretary Grulee.—I think we will have to view this thing very broadly. What we do is going to make a very decided difference. In the past, the Sheppard Towner Act was, as you know, very definitely supported by the pediatricians as a whole. And if we, as a body, take action against this, we want to be very careful that we are not doing so in a manner that is small. We must look at it in a large way.

Candidly, I have no sympathy with Dr. Young's opinion regarding what we should do with regard to the general profession. When the Sheppard Towner Act was first being considered, the American Medical Association condemned the Section on Diseases of Children for taking a stand contrary to them. They did not take our advice nor did they ask it. They simply said, "You have nothing to say in this matter. We will determine it." We, as a body of pediatricians, have a right to an opinion. I don't say the Sheppard Towner Act is right and don't say it is wrong, but we, as a body of pediatricians, have a right to an opinion. Upon us rests the question of the welfare of the children of this country. This thing is not to be determined by bureaus or anything else. It ought to be determined purely and simply as to whether it promotes the welfare of the children of this country. It may be that some of the principles are wrong, I don't know, and am neither talking for it nor against it, but the viewpoint must not be in this society a question of what other societies think or a question of whether there is some bureau being supported. It is a question of whether we can do good for the children of this country.

President Morse.—It seems to me there is another side to this question. Mr. Hoover is trying to persuade Congress to cut down expenses. I don't think we ought to do anything to increase the expenses. The whole principle of bills like this is wrong. As to the fifty-fifty part of state and federal government, I don't think we should encourage that.

Dr. John T. Thornton (West Virginia).—I hope we will not recommend this movement because it is an invasion of States' rights and contrary to the Constitution, and has numerous other objections.

Dr. Helmholz.—I would like to second the remarks which Dr. Grulee has just made. I do not believe there is anything which has so interfered with the good opinion that the public has held of the medical profession as the opposition of organized medicine to the Sheppard Towner Act.

The question that we have to consider and the basis on which we will be judged by the public is: an organization organized to develop the care and protect the health of children is opposed to a bill, the underlying principle of which is fostering of the care of the mother and child.

We cannot go before the public as opposed to this bill. It does not care about economy. It does not concern itself with anything but the opposition of organized medicine to this bill. I certainly would be very much opposed to our turning down this bill. We can soft pedal it, but, as an organization, I do not believe we can come out in opposition to any bill that is fostering the care of mother and child.

Dr. Luecke (Dallas, Texas).—I agree with Dr. Grulee about the Academy expressing an opinion of its own. I think that is proper. There is one other thing, though, that we might and should consider. It has been expressed several times today that the advancement or the furthering of the work of the care and welfare of the infants and children of this country will depend upon our getting the cooperation of the general practitioner, the practitioners in the small towns and communities.

This organization, as composed at present, is made up largely of men from the larger centers, many of whom are not doing actual clinical pediatrics, pediatric practice as such, at least that is my opinion. If we, as an organization, enforce a bill which it is my understanding is very largely opposed, especially by the general practitioners in the smaller communities, we may by such act stir up enough antagonism so that a large part of the sympathetic activities of that group cannot be depended upon. I think that needs to be considered.

Dr. Greenebaum.—May I have the privilege of reading these letters? One is from Dr. Harold H. Mitchell, medical associate, division of research, American Child Health Association, and the other from Dr. Philip Barbour, president-elect of the Kentucky State Medical Association.

Dr. Greenebaum read the communications.

Dr. Moore.—I think one of the difficulties may be illustrated by the present status of the school health program. It is relatively easy to set up a thing in the name of education. It may be exceedingly difficult to deliver and make it distinctly worth while from an educational point of view. One of the things in connection with the school health program now, and I think generally one of the great objections as far as the medical profession is concerned, is the fact that so many of the school health programs are of service character which is oftentimes undesirable. That a school health program which is distinctly a service procedure is often an easy thing to put over. It is much easier to deliver a service program than an educational one. The service program is popular. An educational program may deteriorate into a service program as have many school programs even in the hands of educational authorities. One of the present-day efforts is to rescue the school health program and make it a worth-while educational procedure instead of a poorly executed service one. I fear that as an educational procedure the Jones plan will be done poorly and that there is danger of its degeneration into a service feature.

Chairman S. McC. Hamill.—Is it your opinion that it has been administered in an unsatisfactory fashion in the years it has existed?

Dr. Moore.—In Iowa, we had the Sheppard Towner Act over a period of several years. Now we have been without it for several years. If it had been operating there recently, I doubt if we could have brought together the various organizations of the state in the cooperation we now have with the medical profession. I should like to have Doctor Hill say what he thinks about it.

Dr. Hill.—I should agree with Dr. Moore. I should hate to see the bill sponsoring this thing in effect in Iowa again. I know it would meet with a great deal of opposition among the general practitioners of Iowa. It seems to me, with the feeling expressed here, the Academy can hardly go on record one way or the other.

Secretary Grulee.—I think we should have the viewpoint of the committee. The committee did not feel it was up to the American Academy of Pediatrics to say whether the United States Senate and House of Representatives should make an appropriation. They did not feel it was advisable to interpret whether this was

constitutional, state rights or anything of that kind, but considered it from the welfare of the child and not from the general standpoint of the question.

As citizens of the United States, we can take one standpoint. We might take another as members of the American Academy of Pediatrics. I do not approve of appropriations for these things either, but I can see if appropriations are going to be made for every other thing, possibly an appropriation for the health of the child might be a good one. I cannot say whether I am in favor of the Jones-Bankhead Bill, but I want you to get the viewpoint from which the committee considered it.

Chairman S. McC. Hamill.—Dr. Hill, in his remarks, made a suggestion which is passing through my mind, and I am very much in favor of the opinion expressed by Dr. Helmholz, that we, at least, soft pedal our action in regard to this bill.

I am wondering whether we might not approve that part of the committee's report which deals with the function of the committee and except the part which relates to the Jones-Bankhead Bill. What is the feeling of the Academy on that suggestion? Will those gentlemen who made the motion that the report be accepted be willing to accept such an amendment if anyone makes it?

Dr. Mitchell.—I would be very happy to do so.

Chairman S. McC. Hamill.—I merely make the suggestion that if anyone feels inclined to offer such an amendment, it might be in order.

Secretary Grulee.—The committee report consisted of two things, a suggestion for the attitude of the Academy on this proposed bill. Second, a general statement of principles regarding our attitude toward philanthropic agencies in general.

Dr. Hamill's suggestion is that we act on the latter portion of the report rather than on the report as a whole.

Dr. Moore.—If it is in order, I move that we adopt that portion of the report relating to philanthropic agencies.

Carried.

A motion was made and seconded that the first part be recommitted to the committee for further study.

Dr. McCulloch.—Might it not be a good plan to consult the state chairmen of the states in which the Sheppard Towner Act has already been in operation?

The question was called for and the motion carried.

President Morse resumed the chair.

Committee on Nursing Education

Walter R. Ramsey, St. Paul, Chairman

Last year the committee on Nursing Education in Pediatrics sent a questionnaire to all of the state boards for nurses regarding their requirements in pediatrics.

Of the forty-five who answered, only twenty required as much as three months and a considerable number of states had no requirement at all.

This year we thought it would be well to ascertain what the leading teaching hospitals in this country required and what they advised in the way of pediatric requirements.

The questionnaire with replies is as follows:

1. What is the total number of hours devoted to pediatric nursing in your nurses' training school?

The average requirement was thirty hours, only one requiring forty-five hours.

2. What proportion of the total time allowed for clinical training is given to pediatrics?

Three months, only one four months.

3. How much time is given in your training school to each of the following subjects:

a. Contagious diseases

b. Child behavior?

One hospital required two months, the others from fifteen to thirty hours.

4. Is the training in the newborn nursery given by personnel specially trained in pediatrics or is it given by obstetrical nurses and doctors?

In only two hospitals were the newborn cared for by pediatric nurses and pediatricians, the others were given supervision by obstetrical nurses and obstetricians.

5. What part of the three years' training for nurses do you regard as the minimum which should be spent in pediatrics?

The majority required three months, only two regarded four to six months as a minimum requirement.

6. What is the minimum amount of preparation necessary for a nurse who wants to do pediatric nursing?

The majority regarded three months as the minimum, two others thought six to eight months of special training necessary.

7. What special preparation should a nurse have to qualify for:

a. As supervisor in a children's hospital or children's ward? Most felt that in addition to the three months' undergraduate training, six months to one year of special training, the postgraduate work to include contagious disease nursing, principles of supervision, and general experience, either in general duty nursing or as head nurse to demonstrate ability to direct others and gain administrative experience.

b. As superintendent or superintendent of nurses in a children's hospital?

Same as (a) plus extended supervisory experience and administrative experience.

c. As instructress for nurses in a children's hospital or children's pavilion?

Same as (a) plus wide experience in principles of teaching.

d. School nurse?

Same as (a) plus visiting nurse experience, infant welfare experience, with at least one year in public health nursing.

Your committee, after consulting with the heads of several children's hospitals, feel that every pupil nurse, before graduation, should have a minimum of three months in pediatrics, not only in theory but in actual care upon children in a children's hospital or pavilion.

She should have special instruction under pediatricians and pediatric nurses in the newborn ward, and the newborn ward in general hospitals should be under the supervision of pediatricians and nurses specially trained in pediatrics. The time allotted to surgery and general medicine, even in these foremost hospitals, is often three times as long as that required for pediatrics. We feel that six months in the undergraduate course should be devoted to pediatrics, and if there is not sufficient material in the hospital, the school should affiliate with a children's hospital. Attendance on child welfare clinics for well babies offers a varied experience in handling and feeding babies, which every nurse should know, and which would complement the training received in the hospital.

To do pediatric nursing, a nurse should be specially qualified in the way of temperament for this work. She should then have six or eight months of special training which must be varied and practical.

A school nurse or other public health nurse dealing with children should have a minimum of six months in pediatrics in her undergraduate course and then attend a whole course of nine months in public health nursing, such as is given in the University of Minnesota. This includes elements of preventive medicine, maternal and child hygiene, tuberculosis and its control, principles of public health nursing, field practice in infant welfare nursing, field practice in a tuberculosis sanitarium, field practice in visiting nursing, family health problems.

In institutional work, either supervisory or administrative, a nurse must have the equivalent to the above, so that she is thoroughly competent to give the necessary care to the children and to instruct others. There is a tendency to employ nurses for such responsible positions because they have an agreeable personality, and know how to get along with the superintendent and the staff, rather than for their knowledge of children and their care.

Report accepted.

Committee on School Health and Health Education

Fred T. Moore, Des Moines, Chairman

PART I

The Committee on School Health and Health Education calls attention of the Academy to a distinct opportunity for important service in the field of health education.

The nation-wide interest of educators and laymen in health education needs no comment. The significant fact is that the medical man who knows most about child health and development wields the least influence in this important educational procedure. Some good things are being done. Much of misinformation is offered. This is the natural outgrowth of the demand by the laymen for instruction and the educators to give it. A small measure of assistance has come from qualified medical men. Much has come from physical educators, nurses, persons trained in domestic science, so-called "nutritionists," health "specialists," "health coordinators," The National Dairy Council, The National Breadmakers Association, The United Fruit Company, Insurance Companies, The W. C. T. U., etc. From such are the materials of health education often derived. The committee is not criticising, neither is it approving.

Your committee is confident that educators are more than eager to have the best material available for presentation. They will welcome with open arms any assistance by qualified medical men in the selection and constructive criticism of selected materials.

Your committee holds that no group of medical men is so well qualified to pass on the accuracy and desirability of subject material as is the membership of this Academy. We believe that methods of rendering this service can be developed if the membership of the Academy desires to render such service.

PART II

In the development of such plans the committee believes it essential that approach should be made by the central authorities and state committeemen of the Academy to local superintendent of schools in those communities where members of the Academy reside. In this manner the local pediatrician may be brought into contact with the school program without embarrassing advances by himself.

In such a plan the committee or central office of the Academy would cooperate with the state committeemen and local pediatrician, providing information as to methods of procedure, sources of desirable materials and receiving from him the results of his experience in his local contacts.

In this manner it would be possible to develop a fund of information pertaining to health education which, insofar as content is concerned, would have the widespread approval of influential physicians.

PART III

Your committee recognizes that the programs of school service, i.e., the things that are done to and for the physical bodies of children, contain many undesirable practices. This committee has no power to change these practices except through the activities of members of this Academy. The practices referred to are extremely variable and colored by local situations. Therefore, they can be influenced chiefly by local people of broad vision who understand the factors in the community.

The schools' responsibility is education, not service. Therefore, the program in health education is of greater fundamental significance than is the program of service. Your Committee believes that if this Academy is genuinely interested in and gives constructive help in health education its members will be in an advantageous position to correct later many of the objectionable procedures in service programs.

Dr. Moore.—I regret the committee has accomplished little in the past year. At home we have been so busily engaged in putting our own house in order, that we have been able to do little for the national committee. There has not been opportunity for the committee to get together but we have worked out a proposition which I have presented.

If it is the desire of the members of this Academy to lend assistance in this respect, I think the committee on School Health and School Health Education can give them assistance in this respect.

Report accepted.

No report from the Committee on Mental Hygiene.

Secretary Grulee.—There were two things left out of the report of the Executive Board.

It was first recommended that the chair be given the privilege of nominating three members to act as a joint committee with a like number from the Section of Pediatrics of the American Medical Association and the American Pediatric Society for the representation in the International Congress which is to take place in London, in 1933. The Section on Pediatrics has already named its three members.

President Morse.—Does the Academy approve of the action of the Executive Board?

Approved and carried.

Secretary Grulee.—It was passed by the Executive Board that we meet next year on the Monday and Tuesday preceding the sections of the American Medical Association, and that we meet in the vicinity of Milwaukee, the place to be chosen by the secretary.

Approved and carried.

Dr. Durand.—There was one other thing, the action of the Executive Board in making western Canada a part of Region IV instead of Region V as it is at present. Since there are four days and nights' distance from eastern Canada, and western Canada is very close to us, and since our local pediatric society includes

the members of western Canada, I think such action should be taken and it was my impression that such was the case.

Secretary Grulee.—It was in my report, but it was not acted upon.

Carried.

Report of the Nominating Committee

Dr. DeBuys.—In the absence of Dr. Abt, it is my pleasure to make the report of the Nominating Committee. We wish to place in nomination Dr. John Ruhrah, of Baltimore, as President-elect of the Academy.

The only other vacancy to fill was that of Chairman of Region II, and we wish to submit the name of Dr. E. C. Mitchell, of Memphis, Tennessee.

President Morse.—Are there any nominations from the floor? If not a motion to empower the secretary to cast one ballot for these two nominees would be in order.

The motion was seconded and carried.

The meeting adjourned at 12:30 P.M.

Saturday Afternoon Session

Address, "Diet and Teeth," Guy S. Millberry, D.D.S., College of Dentistry, University of California.

Address, "Filterable Bacteria and Their Significance," Arthur I. Kendall, M.D., Ph.D., Dr.P.H., Professor of Bacteriology, Northwestern University Medical School.

Academy News

Report of the State Committee of Iowa American Academy of Pediatrics

Our fundamental thesis has been that of cooperation of all interested groups. Every movement has been guided in that manner which we thought would best enlist the interest of qualified medical practitioners and give them such opportunity for leadership as their abilities might entitle them. Therefore, we started with the Iowa State Medical Society.

I. Committee on Child Health and Protection appointed by the Iowa State Medical Society.

The Academy Committee for Iowa considered the advisability of such a committee at a session of the Iowa Pediatric Club, in May, 1931. The concensus of opinion was that there should be such a committee which would speak for the state society. The following were appointed to that committee by the President of the Iowa State Medical Society:

Fred Moore, Pediatrician, Chairman, Des Moines
Lee F. Hill, Pediatrician, Des Moines
J. D. Boyd, Pediatrician, Iowa City
E. D. Plass, Obstetrician, Iowa City
Judd Shellito, General Practitioner, Independence

II. The local members of the Academy's state committee have had repeated conferences for consideration of pediatric interests. These conferences have been held with the following groups:

1. Local pediatricians.
2. Local general practitioners.
3. Officials of State Health Department.
4. Officials of city health departments.
5. Officials of State Department of Public Education.
6. Officials of city boards of education.
7. Officials of State Bureau of Child Welfare.
8. Officials of Iowa State Medical Society.
9. Officials of Iowa State Tuberculosis Association.
10. Officials of local Public Health Nursing Association.

In this manner there has been a unity of purpose and procedure for the Academy's committee, the committee of the state society and for Iowa Pediatric Club.

III. The members of the Academy's state committee have cooperated with the speaker's bureau of the Iowa State Medical Society in the following activities:

1. Providing pediatric programs for county, district and state societies.
2. Providing speakers for lay meetings for presentation of subjects pertaining to medical phases of child health and protection.
3. Radio presentation of medical subjects pertaining to child health and protection. (The state medical society offers two programs weekly.)

IV. The Academy's state committee has devoted the major part of its energies to the development and guidance of the Iowa White House Conference on Child Health and Protection. The chairman of the Academy's state com-

mittee was chairman of the medical section of the conference and subsequently made chairman of the general program committee of the conference.

Practically all of the men engaged in pediatrics in the state contributed to the investigation and program of the conference. The active assistance of men engaged in obstetrics was obtained and the interest of many general practitioners was enlisted.

The conference is generally considered as having been a success. The attendance was state wide and exceeded a thousand in number. The meeting place was filled for the first and the last numbers of the program. Some eighty papers, dealing for the most part with conditions in Iowa were presented. Thirty-six of these were offered by men of the medical profession —either pediatricians, obstetricians, general practitioners or public health men.

The active interest and support of the Iowa State Medical Society was constantly manifest in the development of the conference. The president of the state society presented a paper in the public health section.

The medical section of the conference presented as guest speaker Dr. E. H. Cary of Dallas, Texas, president-elect of the American Medical Association. It is hoped that every member of the Academy may read Doctor Cary's address, or better, hear him express his forward-looking views of the doctor's responsibilities in child health and protection. The public health section of the conference presented as guest speaker, Doctor S. J. Crumbine of the American Child Health Association.

V. The Academy's state committee, working through the medical section of the Iowa White House Conference, has sponsored a pediatric program for Iowa State Medical Society which has its annual meeting next month. In addition to the clinical discussions that program will include a review of the medical section of the Iowa White House Conference and an address by Professor A. J. Carlson, of the University of Chicago, on the subject—"The Doctor's Responsibility in Child Health and Protection."

Final Program for the State Medical Society, 1932

1. The Medical Section of the Iowa Conference on Child Health and Protection.
   Fred Moore, M.D., Des Moines
2. Physical Diagnosis in Children.
   Demonstration of Physical Examination.
   R. H. McBride, M.D., Sioux City
3. Diagnosis of Childhood Tuberculosis.
   Use of Diagnostic Tuberculin.
   Significance of Reactions. Roentgenography.
   C. A. Stewart, M.D., Minneapolis
4. Control of Diphtheria and Smallpox in Iowa.
   To what extent are children protected? A survey of present methods of promotion. The necessity for medical leadership.
   Martin D. Ott, M.D., Davenport
   Discussion by Howard A. Lanphere, M.D.
   Iowa State Department of Health.
5. Cerebral Hemorrhage of the Newly Born.
   E. D. Plass, M.D., Iowa City

6. Nutrition and Dental Caries.
J. D. Boyd, M.D., Iowa City
C. L. Drain, D.D.S., Iowa City

7. Child Health and Protection—The Physician's Responsibility.
A. J. Carlson, Chicago

VI. Publicity.

In all these activities attention has been given to publicity in the medical and lay press.

1. Medical.

The Journal of the Iowa State Medical Society has been generous in the space given to accounts of these activities.

The monthly Bulletins of the Des Moines Academy and Polk County Medical Society have published much of medical interest.

2. Lay Press.

The Iowa White House Conference received almost as much publicity in the press of the State as the American Association for Advancement of Science which met here two years ago. Up to the close of the conference, 1,673 stories occupying 11,065 column inches were published. Adding to this the estimate of stories published since the conference—brings the total to about 2,600 stories and 20,000 column inches. This does not include any associated press reports.

3. Arrangements have been made with the Journal of the Iowa State Medical Society to publish a pediatric number at an early date. This will include the pediatric program for the State Society and the medical section of the Iowa White House Conference.

These activities have been developed by the spirit which engendered the American Academy but in the name of "Child Health and Protection."

Summary

I. Committee on Child Health and Protection appointed by Iowa State Medical Society at request of Iowa pediatricians.

II. Cooperation with all organizations interested in Child Health and Protection.

III. Cooperation with Speaker's Bureau of Iowa State Medical Society.
1. Pediatric programs.
2. Speakers for lay meetings.
3. Radio programs.

IV. Participation in Iowa White House Conference.

V. Special pediatric program for the annual session of the Iowa State Medical Society.

VI. Publicity.
1. Medical press.
2. Lay press.

Respectfully,

(Signed) FRED MOORE, M.D.

News and Notes

The following committees have been appointed as the American Committee for **The Third International Pediatric Congress** to be held in London in 1933.

For the American Academy of Pediatrics.
Jay I. Durand, Seattle
Alfred F. Hess, New York
Borden S. Veeder, St. Louis

For the American Pediatric Society.
C. A. Aldrich, Winnetka
Clifford G. Grulee, Chicago
A. Graeme Mitchell, Cincinnati

For the Section on Pediatrics, A. M. A.
Henry F. Helmholz, Rochester, Minn.
John L. Morse, Boston
William Weston, Columbia, S. C.

For the Society of Pediatric Research.
L. Emmet Holt, Jr., Baltimore
Charles F. McKhann, Boston
Joseph Stokes, Jr., Philadelphia

Dr. Helmholz has been elected chairman and Dr. Aldrich secretary.

The **Section on Pediatrics of the American Medical Association** at its meeting in New Orleans elected Dr. F. C. Schlutz of Chicago as chairman; Dr. M. G. Peterman of Milwaukee as vice-chairman; Dr. Alfred A. Walker of Birmingham, Alabama, was re-elected secretary. The next meeting will be held in Milwaukee, at the time of the American Medical Association meeting.

The **American Pediatric Society** at its annual meeting in Rochester, Minnesota, elected the following officers for the ensuing year: President, Dr. Oscar M. Schloss, New York; vice-president, Dr. James L. Gamble, Boston; secretary and treasurer, Dr. Hugh McCulloch, St. Louis; editor and recorder, Dr. C. A. Aldrich, Winnetka, Illinois; member of the council, Dr. Grover F. Powers, New Haven. The next meeting of the society will be held at the time of the Congress of American Physicians and Surgeons in Washington, D. C., May 8, 9, 10, 1933.

The **Society for Pediatric Research** will hold its next meeting in New York City on Saturday, May 6, 1933, preceding the meeting of the Congress of American Physicians and Surgeons in Washington the following week. This society was organized two years ago for the purpose of providing an opportunity for younger men in investigative pediatrics to present the results of their work. The meetings are held annually. Members are selected from all parts of this country. The president is Dr. Bengt K. Hamilton of Chicago and the secretary is Dr. Charles F. McKhann, Boston.

The **Central States Pediatric Society** will hold its meeting in Kansas City, Missouri, on October 7, 8, 1932, under the presidency of Dr. Frank C. Neff.

During the past winter the meetings of the **Children's Section of the Royal Society of Medicine** have been held monthly as usual; the cases shown have been excellent, and have provoked interesting discussion. Since they are reported in detail in the proceedings of the society, no further comment on them is necessary here. In April a cinematograph film of medical conditions was shown for the first time at this section. Mr. Barrington Ward demonstrated in this way the operation of abdominal sympathectomy for Hirschsprung's disease. Apart from the scientific value of the film, the photography was of an exceptionally high order and served to emphasize the value of this method in describing operative procedures.

Although primarily odontological in nature, probably the most interesting controversial matter to pediatricians that has arisen during the past six months, has been the publication here of three papers dealing with dental caries. Firstly, in January, 1932, Mr. Evelyn Sprawson, lecturer on dental surgery at the London Hospital, gave a paper at the Royal Society of Medicine on the influence of raw milk on the teeth. He had supervised groups of children in institutions over a period of years, with careful dietary control. His observations led him to the conclusion that, with a daily ration of raw milk begun preferably in early infancy, well-formed teeth having a considerable degree of immunity to dental caries may be developed, quite independent of antenatal care, although such care in addition should make them still better. Then in March, Mellanby and Pattison published a paper in the *British Medical Journal*, in which they claim that the initiation and spread of caries was almost eliminated by the use of a diet rich in vitamin D and calcium but free from cereals and that the results they obtained were more favorable than in their previous investigation, in which vitamin D alone had been increased in a diet containing bread and other cereals. They appear to apportion the greatest share of blame for the development of caries to cereal foods rather than to the vitamin deficiency which they had previously stressed. Apart, however, from the question of palatability, the diets they used would seem to be quite impracticable for the poorer classes of society. Lastly, in the same issue of the *British Medical Journal*, an account is published of the investigation carried out by Surgeon Lieutenant Commander W. Sampson, R. N., in the settlement on the island of Tristan Da Cunha. A dental examination was made of all the inhabitants and dental caries was found to be almost absent. In the age groups 1 to 21 years—total 78 persons—there was an incidence of 0.1 per cent caries in the temporary teeth and of nil in the permanent teeth! These islanders never clean their teeth; they are all breast fed in infancy; milk is plentiful and freely used—always raw; fish is largely eaten, as are eggs; potatoes form with fish their staple diet and bread, cereals, and sugar are hardly ever eaten. It is difficult to find in these three contributions a definite indication of any one single factor common to all, which can be taken as specific in preventing dental caries. There are probably several factors involved, and it can only be said at this moment that further investigation is required to solve this very important and interesting problem.

The **British Pediatric Association** held its fifth annual meeting at Windermere at the end of May, Dr. John Poynton being the chairman. An interesting and varied program was presented and included a discussion on the teaching of pediatrics in British Medical Schools.

KENNETH TALLERMAN, M.D.
London

Book Reviews

Body Mechanics: Education and Practice. Report of the Subcommittee on Orthopaedics and Body Mechanics. The White House Conference on Child Health and Protection. The Century Co., New York, 1932. Pp. 166.

This publication of the White House Conference sets the seal of approval of an important group of experts in child health, upon the hypothesis that good body mechanics, or posture, is closely associated with good functional health and bad body mechanics with bad functional health. The illustrated volume of 160 pages contains the report of the subcommittee on Orthopaedics and Body Mechanics serving under the main Committee on Medical Care, of which Dr. Philip Van Ingen was chairman, and the rather far-reaching recommendations of this subcommittee. In an Appendix which contains more pages than the report itself, there will be found a survey of some 2,000 school children made under the auspices of the Children's Bureau of the U. S. Department of Labor. This is called "Posture and Physical Fitness" and comprises a two-year study of control groups, to one of which body mechanics was taught and to the other of which only the regular school calisthenics were given. It is a most illuminating document showing the amazingly large incidence of poor body mechanics among the nation's school children and also what may be expected from a daily training in good body mechanics which does not interfere with the regular school curriculum. As if to point the lesson of this survey, there follows a Manual of Body Mechanics which has been approved by the Department of Physical Education of the Boston Public Schools and is now an integral part of the regular physical education in all the day elementary and day intermediate grades.

For the first time there has been included in one attractively printed small book the theory of body mechanics and the evidence of its importance, the test of its application to a large group of children, and the details of this application in the form of a manual. The volume lives up to its excellent title, "Body Mechanics: Education and Practice," and should be read and digested by all doctors, social workers and educators interested in child welfare and in the development of a more efficient, more upstanding race than the universal draft of the World War revealed America can now boast. It concerns the vitals of the nation.

ROBERT B. OSGOOD.

Growth and Development of the Child. Part III. Nutrition. Report of the Committee on Growth and Development. The White House Conference on Child Health and Protection. The Century Co., New York, 1932. Pp. 532.

There comes a time in the development of most scientific endeavors when those who are directly concerned therein find it wholesome, if not actually necessary, to take an inventory of their observations. In this way they become aware not only of the positive contributions that have become available, but also of the unsolved problems that still confront them. Ofttimes it is very important for the rational progress of investigation to have its debated questions and its uncertainties carefully formulated, so that the devotees of science will not fail to realize clearly what the limitations of our knowledge are. This is particularly true in medicine and in the field of nutrition where tradition tends to play such a large part in the practical aspects of the subject.

The argument that the race has somehow survived throughout the centuries without, or perhaps even despite, detailed knowledge of foods and nutrition, is no longer satisfying to thoughtful persons. The modern era has ushered in so many revolutionary changes in our modes of living that we are confronted with immediate problems of dietary innovations, as well as other environmental transformations calling for new decisions. Instinct no longer is an entirely safe guide. Mrs. Ellen H. Richards, an American pioneer who exhibited zeal for the application of science to daily life, long ago sensed "conformity to scientific laws as the only way to safety." As she wrote:

"It is unsafe to trust the individual to the guidance of the appetite alone, for the reason that this instinct was built up for a condition of existence very different from that which enables people of this country to indulge themselves today."

When the White House Conference on Child Health and Protection of 1930 was called at the instigation of President Hoover, the Committee on Growth and Development, under the effective leadership of Dr. K. D. Blackfan of the Harvard Medical School, promptly decided that a stock-taking was in order. The present volume represents one aspect of the outcome of this attempt "to appraise the existing knowledge descriptive of the growth and development of children from conception to maturity." It is, in effect, an up-to-date résumé of the science of nutrition prepared with the collaboration of more than thirty active investigators, many of them persons of international reputation in their departments of research. This fact, by itself, should suffice to indicate the presumptive value of the compilation.

The limitations of a brief review will not permit reference to the details of the numerous essays. They include not merely a carefully edited story of the nature and function of the familiar foodstuffs and the widely discussed vitamins, but also discussions of some of those aspects of nutrition that have lately elicited attention in unanticipated ways. This is true, for example, of the possible rôle of what Professor Mary Swartz Rose has designated as the "trace elements," such as copper in the relief of nutritional anemia. The problems of iron and iodine—elements that are indispensable even though the need is expressed in milligrams—are discussed, as well as the more familiar aspects of the common dietary mineral elements. The debates about the purine-containing beverages—tea, coffee, and cocoa—are reviewed in the light of the limited facts now available. The energy requirements in infancy and later years are given detailed consideration, as are the practical problems of the choice of foods and modern dietetics.

Even feeding habits and the psychologic factors in nutrition receive attention. As the writer of this chapter concludes:

"If only the child were a hopper into which the proper ingredients could be poured, to be mechanically ground into an optimal predetermined result, the problem would be simple and very satisfactory. As it is, the child has a peculiar complex little psychology of his own with many strange little quirks and twists that must be duly heeded or it will nullify much that we have gained by this increasing knowledge of food values. Above all, we must bear in mind that he has an individuality of his own which is different entirely from the individuality of adults. There is something biologically primitive about him that cannot be rapidly transformed into the more stereotyped requirements of conventional society of adults and particularly of a social order that is now moving so swiftly that even the adult is floundering in his efforts to keep pace with it."

These words will serve to argue the timeliness of the new volume that truly represents a "labor of love" on the part of those who contributed to make it a success.

LAFAYETTE B. MENDEL.

Comments

THIS issue marks the beginning of a new journal devoted to the field of pediatrics. Despite the tremendous development of pediatrics in the last fifteen years, there are but two other North American journals in this field; the *Archives of Pediatrics*, which was started in 1884 and the *American Journal of Diseases of Children* dating from 1911. In contrast, we find six pediatric journals published in Germany, four in France, five in Italy, and two in England. The development in recent years of a large number of university pediatric clinics and hospitals for the care of children, has led to a marked increase in pediatric investigation and productivity. At the same time the conception of pediatrics has changed from that of a small limited field to one of broad extent. A thorough investigation by the Publication Committee of the Academy was made before the publication of a journal was undertaken, and it was felt that there was not only opportunity and place for a new pediatric journal but a definite need.

The editors wish to explain briefly at this time the scope of the JOURNAL OF PEDIATRICS. It is their intention to make it as broad and inclusive as the field of childhood itself. It is planned not only to include the clinical and investigative fields of pediatrics but in addition those tangential fields of medicine and child development which give to pediatrics such a unique position among the medical sciences. Thus the fields of public health relations and movements, child psychology, socio-medical conditions, education, as well as the more strictly medical branches; as for example, surgery and its subdivisions, or dermatology, will be included in the material which the journal will present to its readers in so far as they relate to the field of pediatrics.

The general make-up of the journal will be noted as the reader glances through these pages. This is not fixed and may be changed at any time. To this department headed "Comment" we wish to draw particular attention. We hope to make it an open forum where any matters of interest and importance to pediatrics or the physician may be discussed. It is not intended to be a department where the editorial board alone may air its views.

Starting a new journal has not been an easy task. Its shortcomings and deficiencies are recognized. Nevertheless, no excuse or apologies are offered. We hope that the period of infancy and childhood will be rapidly and successfully passed through under the best environmental, nutritional and developmental influences possible and without too many illnesses to overcome. It can only be made a success if it has the support of the entire pediatric family.

There is one other matter that might be stated in this connection, the editorial board recognizes well that the vast majority of American children are under the care of the general practitioner rather than the pediatrician; that is, the physician who limits his field of practice to childhood. The journal is interested primarily in pediatrics rather than the pediatrician. Consequently, every effort will be made to have the material published in the journal of interest and value to the general practitioner. Some further information in regard to the new journal will be found in the report of the Committee on Publications in the Department of Academy News.

THE second annual meeting of the Academy at the New Orleans Country Club on May 13 and 14 was most successful. Despite the depression and the geographic location of the place of meeting, a large number of members from all sections of the country were present.

The experiment of "Round Table Conferences," which was tried for the first time, obtained emphatic approval. Seven subjects of general interest were chosen with a leader for each subject. One section after a three-hour discussion voted to meet again next year with the same group and subject. Perhaps they will let in a few of this year's absentees. One member was heard to remark that he had received more from the conference group than he had ever obtained at a medical meeting before, and that the one afternoon alone repaid him for his trip. The conferences where the leaders provoked the most discussion were the most interesting and most enjoyable. The director of a round table conference must use quite a different technic than when presiding at a meeting in order to provoke discussion and must have a comprehensive technical knowledge of the subject. With a membership the size of the Academy it should not be difficult to develop a group of stimulating leaders for future conferences. There are many topics which offer profitable discussion and some of the topics discussed may be taken up yearly. The regret of most men present was that they could not be present at more than one. We offer the suggestion that each "Round Table" be limited to twenty members.

The committee reports and discussions at the second session showed clearly that the Academy is beginning to grow out of its early period of incoordinated movement and motive and that its purposes and possibilities are showing definite trends. In the afternoon, two addresses by invited guests on subjects of interest to pediatricians were given. If the plans for the coming year materialize, the Academy will be able to cast aside its swaddling clothes by the time of the next annual meeting.

MOST of the men whose names appear as authors of "Original Communications" are well known to all pediatricians. We are honored by having communications from Dr. Abt, the first president of the Academy, and Dr. Morse, his successor in this office. If all workers in the field of child psychology and development were as sane and broad in their viewpoints as Dr. Arnold Gesell of the Yale Clinic for Child Development, there would be little conflict between the psychologist and the physician. All of Dr. Gesell's work is based on careful, painstaking, scientific study and his books on infant growth and mentality should be a part of the pediatrician's reading. Dr. Mont Reid is Professor of Surgery at the University of Cincinnati.

THERE are nearly 4,000 physicians in North America who either limit their field to pediatrics or have a special interest in the field. The JOURNAL OF PEDIATRICS should be of value at least to these 4,000 men. If it is not, we would like to know why not, so the fault may be corrected.

The Journal of Pediatrics

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It is only by expressing vitamin values per ounce of product and comparing with *established values*, that the true vitamin potency of sieved vegetables may be realized. CERTIFOODS *are the only sieved vegetables which carry a guarantee of the known and measured vitamin content of each product.*

The label on every container of CERTIFOODS shows the vitamin content in measured Sherman Units. There is no guesswork. The actual figures are there for all to see—determined by actual and regular assays by a recognized vitamin authority* over a two-year period.

CERTIFOODS are prepared by Certifoods, Inc., under the laboratory supervision of The Maltine Company in order that the profession may have at its command sieved vegetables with known and measured vitamin content, with known and measured content of those other important factors — proteins, fats, carbohydrates and minerals—particularly calcium, phosphates and iron.** Moreover, CERTIFOODS provide, within a fractional percentage, the actual solids content of the raw vegetables. CERTIFOODS are sold in enamel lined containers by drug stores exclusively.

Certifoods, INC.
Subsidiary of
THE MALTINE COMPANY
30 VESEY STREET NEW YORK, N. Y.

*Name on request.
**See CERTIFOODS Nutritive and Assay Report—copy on request.

THE MALTINE COMPANY, *Certifoods Division*, 30 Vesey Street, New York, N. Y.
Please send me professional samples of CERTIFOODS and copy of the vitamin and nutritive assay report.

Name of Physician _____

Office Address _____

City or Town _____ *State* _____